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## **Analysis and Projections of the Efficacy of Non-Pharmaceutical Measures against Covid-19 in Nigeria**

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### **Abstract**

*This study shows the efficacy of the various non-pharmaceutical control measures in line with the international protocol against COVID-19 in Nigeria as well as offers a year's projection of the likely effects of the disease in Nigeria. The study adopts a cutting edge variant of the SEIR epidemiological model and made use of a mathematical software Geogebra to estimate the model. The findings of the study indicates that the virus is not much a problem in Nigeria as it does not have the capacity of causing more death than usual and the adoption of more non-pharmaceutical control measures in the country for a year will not significantly improve the welfare of Nigerians.*

**Keywords:** SEIR, COVID-19, Non-pharmaceutical, Measures

**JEL Classification:** I11, I18

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### **1. Introduction**

The spread of Covid-19 diseases and the low death rate of the diseases in many Sub-Saharan African economies compared to their counterpart in Europe and America is a source of suspicion and doubt with regards to the narrative of the risk of the virus in Nigeria and other countries in the sub-region. Unlike other parts of the world, after ten months (March 1<sup>st</sup> – January, 2021) of the disease, the fatality rate is less than 3 per cent of the infected in Nigeria. This is an indication that the disease is not really a matter to worry about, because it is yet to be responsible for large number of death in Nigeria like malaria. For example the official figures indicate that death by malaria in Nigeria accounts for a quarter of global death from malaria (Nigeria Center for Diseases Control (NCDC), 2016) but the death rate from the novel virus is less than 3 per cent for ten months now.

Although neither the infection mode nor the epidemiology of the two(malaria and Covid-19) diseases are same, the attention Covid-19 is receiving in terms of technical and financial interventions is displacing those of other diseases that are deadlier in Nigeria(World Health Organisation, 2020). The extent to which the amount of attention given the novel disease impacts on the accumulation of confirmed cases, death, exposed and infectious individuals in Nigeria is not clear. While many countries especially in Europe and America recorded thousands of



death from the virus in few months, Nigeria being the most populous country in Africa is yet to have up to two thousand death from the novel disease after ten months of the index case. Yet the Nigerian authority massively implements the protocol of COVID-19 by World Health Organization (WHO) but it is not clear whether the intervention by the country's authority is yielding any good result.

Therefore, the objective of this study is to analyze the effects of the intervention by the Nigerian authority on the spread of the disease and the proportion of death arising from the disease. For the purpose of this study in particular, recovery rate and hospitalization rate (isolation center) of the infectious were used as proxy for the interventions of the Nigerian health authority against COVID-19. Most of the interventions in Nigeria are in line with global best practices and the official advice of the WHO. This study is particularly informed by the fact that several studies argued that the protocol against the virus by WHO could be effective if adequately implemented, yet the case of Nigeria is such that the protocol is officially implemented but the effective implementation in the country's large informal economy may not be assured.

## **2. Literature Review**

So far the literature of COVID-19 is multifaceted; some are particular about the biology or biochemistry of the virus and many others are interested in the epidemiology of the virus (Mason , 2020; Harrison, 2020; Susan & Sonia, 2005; Hussin & Siddappa, 2020; Yuanji, Tamires, Laureane, Sherry, Renata , & Sandro, 2020). While some of them are mainly global in scope many others focused on some countries or group of countries (Fatimah, Phillip, Gibril, Micheal, William, & James, 2020, Nishant , Preeti, Ratho, & Shailendra , 2020). Meanwhile, there have been several concerns about the likely consequences of the pandemic in developing economies in Africa with weak health system (Matthew, et al., 2020). Nigeria is the largest economy in Africa and at the same time the most populated and its health sector has not witnessed a challenging period like this period (pandemic) in recent history. Some scholars have attempted at profiling the socio-economic situation of life in Nigeria following the pandemic (Amzat, Aminu, Kolo, Akinyele, Ogundairo, & Danjibo, 2020). The consensus in the first three months of the pandemic and the lock down policy was so that community level infection is on the rise and will continue for a long time should the social distancing among other non-pharmaceutical control measure of curbing the menace of the disease increase.

Many studies made attempt at predicting the trend of the accumulation of cases, infections and death from the disease in Nigeria. Ayinde, Lukman, Rauf, Alabi, Okon, & Ayinde (2020) used econometrics models at identifying the best estimator and the models for predicting the spread and death caused by the virus in Nigeria. The results of their findings suggest that the Least Absolute Deviation (LAD) estimator offers precision in the forecast of the spread of the virus than nine other estimators indicated in their work. However, unlike econometrics or statistical models, the classic epidemiology model i.e. the SIR first suggested by Kermack and McKendrick in 1927 is a deterministic mathematical model with clear theoretical underpinnings about the compartment of epidemics. Several other variants of the SIR model have been used to model COVID-19 and the SIR model

has also been expanded to as much as it reflects realities. Giordano et.al(2020) for example modeled the transition phases of the disease as Susceptible (S), Infected (I), Diagnosed (D), Ailing (A), Recognized (R), Threatened (T), Healed (H) and Extinct (E), otherwise termed SIDARTH. Similarly, Iboi *et.al.* (2020) modeled the compartment and spread of the virus as susceptible (S(t)), exposed (E(t)), symptomatically-infectious (Is(t)), asymptotically-infectious (Ia(t)), hospitalized (Ih(t)) and recovered (R(t)) individuals. Theirs focused on the impact of the non-pharmaceutical control of the disease like the use and efficacy of face mask, social distancing, the lock down policy among several others in Nigeria. It should be noted that the present work adopts Iboi’s model of COVID-19.

Several other works adopted the Susceptible Infections and Recovery (SIR) model as espoused byKermack and McKendrickto they explain the infectious and recovery accumulation cases of the COVID-19 Lockdown, social distancing and other non-Pharmaceutical control measures are suggested as ways of mitigating the risk of contracting the virus. Social network model has also been used to analyze and explain the spread of infectious disease through the use of a SIR model (Saif, 2019). The research actually aimed at identifying the threshold of infection rate i.e the divide between infection persistence and infections extinction. Its conclusion is that if an infection rate is high enough to infect neighbors, the infection rate will persist but if the rate is not high enough to infect its neighbors the disease will go into extinction.

**3. Methodology**

The study made use of a more suited type of the popular epidemiology model advanced by (Iboi, Sharomiz, Ngonghala, & Gumel, 2020) to model important variables of COVID-19 in Nigeria through the use of a dynamic mathematical model.

In particular, the present study adopts the model formulated in Iboi’s *et.al.* (2020) work. Similarly, the baseline parameters of the study are adaptation of same study. Theirs is among the few that reflected on the reality in Nigeria. It accounts for different categories of the infectious population as it exists in Nigeria because of the low level of medical infrastructures and institutions in the country.

The model assumed that the total population in the country at any time (Nt) consist of those Susceptible to the disease (St), Exposed(Et), asymptotically infectious(Ia(t)), symptotically infectious(Is(t)), hospitalized (Ih(t)), recovered (Rt) and dead (Dt). This compartment of the total population is assumed to be mutually exclusive. Included in the hospitalized (Ih(t)) are those who are observing self-isolation in their respective homes. The following differential equations are the deterministic representation of the model:

$$\frac{dS}{dt} = -\beta_s(1-\varepsilon m \xi m)I_{sN}^S - \beta_a(1-\varepsilon m \xi m)I_{aN}^S \dots\dots\dots 1$$

$$\frac{dE}{dt} = \beta_s(1-\varepsilon m \xi m)I_{sN}^S + \beta_a(1-\varepsilon m \xi m)I_{aN}^S - \sigma E- \dots\dots\dots 2$$

$$\frac{dI_s}{dt} = (1-\lambda)\sigma E - (\phi_s + \gamma_s + \delta_s)I_s \dots\dots\dots 3$$

$$\begin{aligned} \frac{dI_\alpha}{dt} &= \lambda\sigma E - \gamma_\alpha I_\alpha \dots\dots\dots 4 \\ \frac{dh}{dt} &= \phi I_s - (\gamma_h + \delta_h) I_h \dots\dots\dots 5 \\ \frac{dR}{dt} &= \gamma_s I_s + \gamma_a I_\alpha + \gamma_h I_h \dots\dots\dots 6 \\ \frac{dD}{dt} &= \delta_s I_s + \delta_s I_h \dots\dots\dots 7 \end{aligned}$$

where S(t) is susceptible to the disease E(t), Exposed, I $\alpha$ (t), asymptotically infectious, I $s$ (t), symptotically infectious, I $h$ (t), hospitalized, R(t) recovered and D(t) death.  $\beta, \lambda, \phi, \sigma, \xi,$  and  $\gamma$  are coefficients of the respective state parameters associated with them in the model. Table 1 shows the description of each.

The study use empirical values of the proportion of the infectious, susceptible individuals, recovered, hospitalized and death whens the first positive case of covid-19 was discovered in Nigeria on February 29<sup>th</sup> as the initial values of the state variables. Similarly, the range of values of the parameters of the model for Nigeria obtained through using Nigeria data on Covid-19 obtained through the simulation in Iboi's (2020) work, are used as parameters for the baseline scenario. We use dynamic mathematical software *Geogebra* to solve equation 1-7 simultaneously for the numerical values of S(t), E(t), asymptotically infectious (I $\alpha$ (t)), symptotically infectious(I $s$ (t)), hospitalized (I $h$ (t)), recovered (Rt) and dead (Dt). The software automatically graphs the solution path.

The first scenario (Scenario I) is concerned with hospitalization and recovery rate. Hospitalizations (isolation) parameters were adjusted well below the 14 days in the WHO protocol to take note of the effect on the state variables susceptible, exposed, recover, and death. Also, the recovery rate was also changed below and above the baseline to take note of the effect on the state variables.

**4. Results**

*Baseline Scenario*

When all the parameters of the model are within the range indicated to be the normal range of each of the parameters for the case of Nigeria from the simulation in Iboi's (2020) work, the numerical estimation indicates that the proportion of population of the death(D), hospitalized (I $h$ ) and the susceptible (S) are low and only marginally steadily rising (0.004%) from inception of the pandemic to the end of the first year of the pandemic i.e. February 28<sup>th</sup> 2020 to February 28<sup>th</sup> 2021. Meanwhile, as the proportion of those who recovered increased astronomically, so does the proportion of the exposed (D) increased. The proportions of those who are susceptible to the virus are more than 99.9 per cent of the population in the first one year of the outbreak of the disease in Nigeria.

The following are the parameter of the baseline: the recovery rate for individuals who are infectious are within theoretical range of 14 days for those hospitalized (1/14days<sup>-1</sup>) while symptotically and asymptotically infectious individual recover in 7 days (1/7days<sup>-1</sup>). Also, it is assumed that 10 per cent of the population makes use of face mask and that the quality of the face mask is 50 per cent.

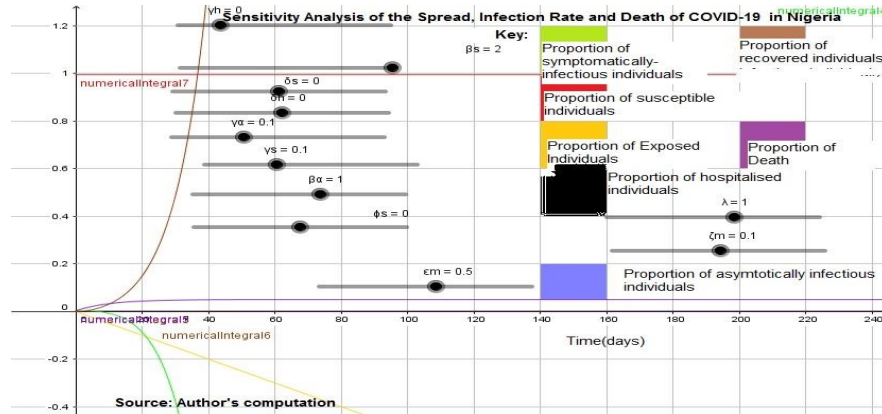


Figure 1: Source: Author's draft

Table 1: State Parameters of the Epidemiology Model

Parameter	Description	Baseline	Nigeria(fitted values)
$B_s$	Effective community contact rate (a measure of social-distancing effectiveness)	0.4	0.401-1.11
$B_\alpha$		0.2	0.38-0.56
$\Phi_s$	Hospitalization rate for infectious individuals	0.0	0.003-0.2
$\epsilon_m$	Efficacy of face-masks to prevent acquisition of infection by susceptible individuals		0.5
$\Xi_m$	Proportion of members of public who wear masks in public (i.e., masks compliance)		0.1
$\gamma_\alpha$	Recovery rate for individuals in the $I_s(I_a)(I_h)$ compartment		1/7days
$\gamma_s$			1/7days
$\gamma_h$			1/14days
$\Sigma$	Rate of progression from the exposed compartment to the infectious compartment ( $1/\sigma$ ) is the incubation period)		5.1
$1-\lambda$	Fraction of exposed individuals who show clinical symptoms at the end of the incubation Period		0.5
$\delta_s$	Disease-induced mortality rate for infectious individuals	0.043	0.011- 0.3
$\delta_h$	(hospitalized, $\delta_h$ )	0.103	0.01- 0.295

Source: Iboi's (2020)

*The Scenario of Changes in Hospitalization and Recovery Rate*

Any increase in the recovery rate of asymptomatic individuals from the usual 7 days indicated in Iboi's (2020) work followed by a 10 per cent increase in hospitalization rate, results in a steady increase in the proportion of the asymptomatic infectious individual in the first year of the pandemic in Nigeria while a negative proportion indicated (in figure 2) for the exposed (E) following the increase in the recovery rate is an indication that the proportion of those exposed (E) but immune to the virus also increase following an increase in the recovery rate of infectious. It should be noted that the rate of change of the asymptomatic and exposed is same but in opposite direction. Meanwhile, the proportion of death (D), hospitalized, symptomatic (Is) and recovered (R) are very low (less than 0.005%) and remain low throughout the first year of the pandemic in Nigeria. Similar to the proportion of the infectious, recovered and death, the proportion of the susceptible remain stable in the first year of the pandemic. As indicated above, while the proportion of the infectious, recovered, and death are low throughout the first year of the pandemic, the proportion of the susceptible are high (above 99%) throughout the first year of the pandemic in Nigeria.

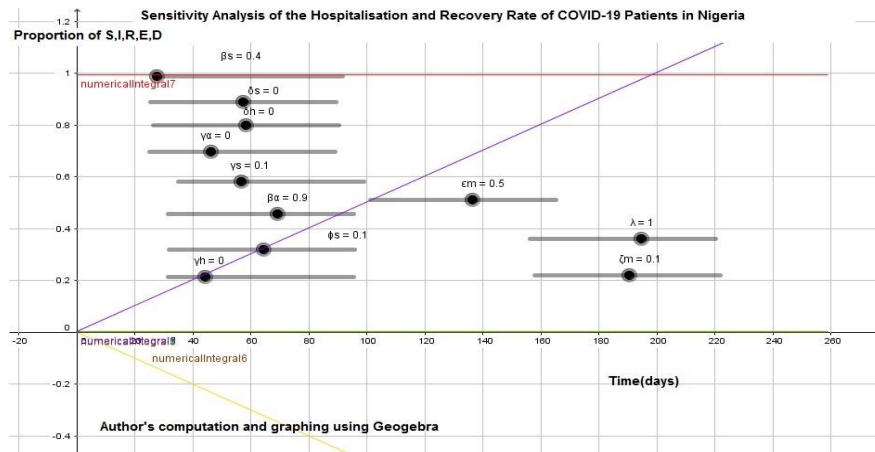


Figure 2: Sensitivity Analysis of the Hospitalisation and Recovery Rate of COVID-19 patients in Nigeria  
 Source: Author's draft

Similarly, if the hospitalization rate ( $\phi_s$ ) is increased by 10 per cent but the recovery rate of the infectious (asymptotically and symptomatically) remains same (7 days), the proportion of the dead will remain very low (less than 0.004 per cent of the population) for the first year of the pandemic in Nigeria but the proportion of the infectious and those that recovered surged astronomically after the first ten days of the pandemic in Nigeria. The proportion of the exposed (E) and the symptomatic infectious (Is) surged in an opposite direction which indicates majority of them are immune to the virus.

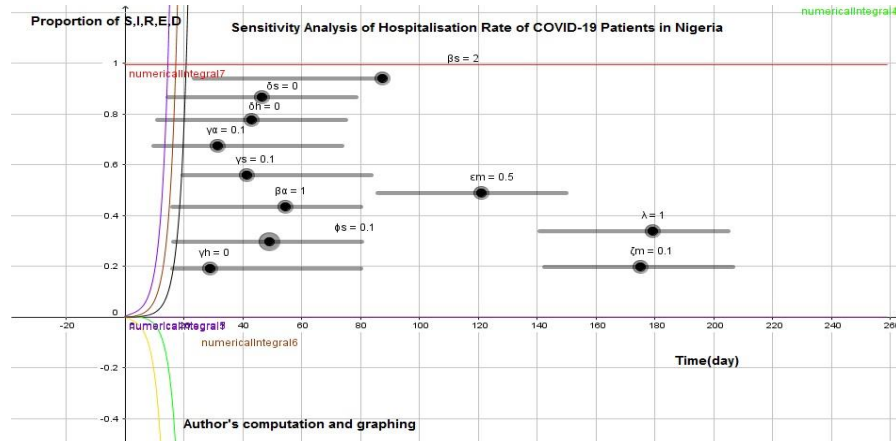


Figure 3: Sensitivity Analysis of the Hospitalisation Rate of COVID-19 patient in Nigeria  
Source: Author's draft

## 5. Conclusions and Recommendation

Using a variant of the SEIR model amenable to condition of live and COVID-19 in Nigeria by Iboi's (2020) work, this study make a year's projection of the likely event as the health authorities put in place several non-pharmaceutical controls in Nigeria like other parts of the world.

So far the non-pharmaceutical controls against the disease does not improve the situation beyond the normal trajectory for months and the projections show that the disease is not much of a threat as it is portrayed in Nigeria. Increase in hospitalization rate for example does not bring about reduction in infections rate neither does it bring about stoppage of death due to the virus.

The study therefore recommends that lockdown policy and other restrictive movement policy against the disease be relaxed and not to be re-introduced in the next twelve months as they are not effective against recovery and rate of spread of the diseases.

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## How Food Secure are Households in Kano North in Pre-COVID-19 and during Covid-19 Lockdown

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### Abstract

*COVID-19 pandemic had negative impact on the activities of households in the entire globe, precisely food security status. The study aims to find how food secure households in Kano north are during COVID-19 lockdown pandemic as against the pre-COVID-19 period. The study uses primary data to draw a sample size of 160 household head respondents, almost the same size of respondents used in pre-COVID-19. The study used descriptive analysis and food security index to determine the level of food security status. Findings from the index reveal that pre-COVID-19 index was 0.7. At the same time, during the lockdown, the situation deteriorates to 0.6, suggesting that the impact of COVID-19 has significantly affected the food security status of the household in Kano north. Also, pre-COVID-19 revealed that per capita calorie requirement was 1,881 kcal against the 1,558 kcal during the COVID-19 pandemic. At the same time, about 52% of the households were food secured at pre-COVID-19 pandemic as against the 32% during the COVID-19 pandemic. The study recommends that government need to introduce measures or investment that are pro-poor to improve the food security status of households. The study, furthermore, recommend that less severe measures of total lockdown need to be put in place to allow farmers to go to farms while following all the measures of social and physical distance and putting face mask.*

**Keywords:** COVID-19, lockdown, pandemic, calorie, index, kcal

**JEL Classification:** Q18, Q54

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### 1. Introduction

The world is not recovery, still in it from the divesting impacts of COVID-19 that is affecting every aspect of our daily life. One of such is the issue of food security challenges among the households in the world. According to the International Food Policy Research Institute (IFPRI) report, close to 690 million individuals were faced with the problem of food security in 2019, which represent an extra 10 million individuals over the 2018 projected figure. This discovery has cast serious doubt as to whether the goal of achieving or eradicating hunger by 2030 is going to be achievable, especially with current COVID-19 pandemic that the world is witnessing (Nguyen, 2020). According to Food and Agricultural Organization (FAO), an estimated 841.4 million people globally are projected to be hungry by



the end of 2020 if the current situation persists, as such the possibility of meeting up with zero hunger in the world by 2025-2030 will be highly doubtful as illustrated in Table 1 (FAO, International Fund for Agricultural Development [IFAD], United Nations Children's Fund [UNICEF], World Food Programme/World Health Organization [WFP/WHO], 2020).

Furthermore, according to FAO *et al.* (2020) the number of Prevalence of Undernourishment (POU) globally has witnessed an unprecedented growth from 2018-2019. The number of POU in Africa is estimated to be more than 250 million in 2019, an increase of 17.6% from 2014. Chunk numbers of the undernourished individuals are located in Sub Saharan Africa (SSA) with about 32 million additional hungry people from 2015 (FAO *et al.*, 2020). Identifiable causes of such increase are the economic slowdown and downturn witnessed in numerous parts of the region within the period, especially in the last 2-3 years. The PoU projection of 2030 in Africa from Table 1 reveals that about 433 million individuals will be hungry, with the majority or about 412 million coming from SSA (FAO *et al.*, 2020).

More than half of the total numbers of hungry people in the world are in Asia, where an estimated 381 million people were undernourished in 2019. However, due to improvement and available data from the Republic of China, there will be a slight reduction in the number of undernourished individuals in Asia by 2030 to about 329 million or 6.6% of the total population in the region (FAO *et al.*, 2020). Table 1 reveals that both Latin America and the Caribbean and Oceania both witnessed an increase in the number of undernourished people in 2019 from 2018 of 48 million and 2.4 million respectively. While 2030 projection reveal that the number will still increase to about 67 million for Latin America and the Caribbean, while Oceania is projected to be around 3.4 million people (FAO *et al.*, 2020; FAO, 2020).

Table 1: Prevalence of Undernourishment in the World

	2018		2019		2030	
	Per cent	Figure	Per cent	Figure	Per cent	Figure
World	8.9	678	8.9	688	9.8	841
Africa	18.6	237	19.1	250	25.7	433
<i>North Africa</i>	6.3	15	6.5	16	7.4	21
<i>Sub-Saharan Africa</i>	21.4	222	22	235	29.4	412
Eastern Africa	26.7	113	27.2	118	33.6	192
Middle Africa	29	49	29.8	52	38	91
Southern Africa	7.9	5	8.4	6	14.6	11
West Africa	14.3	55	15.2	59	23	119
Asia	8.4	385	8.3	381	6.6	329
Latin America/Caribbean	7.3	47	7.4	48	9.5	67
Oceanic	5.7	2.4	5.8	2.4	7	3.4

Source: FAO *et al.*, 2020

FAO *et al.* (2020) identified numerous causes that pose threats to food security progress in the world. For instance, in 2017 and 2018, the organization attributed conflicts and climate changes as the leading causes of food security challenges.

However, in 2019 the threat to food security can be traced to the effort of economic slowdown and economic downturn. But in 2020 COVID-19 and severe outbreak in locust, especially in Eastern Africa pose a severe challenge to hunger, food insecurity and malnutrition among households in the world. Unless the matter is given adequate and immediate attention, the havoc that the pandemic will cause is better imagined (FAO et al., 2020).

Nguyen (2020) estimated that about 83 million-132 million additional people would be pushed to serious food security challenges or chronic hunger in 2020 due to COVID-19 pandemic. The pandemic can also affect the nutritional status of millions of vulnerable populations and at the same time deteriorate the health as well as the socio-economic conditions of the entire world (FAO et al., 2020).

According to Schmidhuber *et al.* (2020); Torero (2020) and Savastona (2020) identified various ways through which pandemic can affect food security and food systems namely shocks in both the demand and supply of food systems throughout the globe. In the supply side, food shortage might not necessarily be caused by COVID-19 pandemic, since the assumption is that the production of various staple foodstuffs (wheat, rice, maize and soybean) will be static and above the average production in 2020 (Agricultural Market Information System [AMIS], 2020). However, the pandemic has disrupted food supply chains throughout the globe. For instance, labour mobility in locations dependent on seasonal farming has been limited by the COVID-19 containment measures put in place by the various governments to control the spread of the pandemic in the world. Also access to markets and transportation of foodstuffs locally and across regions/countries has been affected by the lockdown measures. At the same time, logistics for the new farming seasons has also been affected by the COVID-19 pandemic (Schmidhuber, Pound & Qiao, 2020).

Massive containment measures especially the lockdown measure across the world, affected households' capacities to access food, subsequently affecting the demand side as well as the economic downturn. In this regard, both poor and the vulnerable find it difficult for food. Both the low- and middle-income nations of the world are likely the most impacted because they have or lack shock or contingency measures and available funds to stimulate their economies during the pandemic. Therefore, any form of pandemic-induced global economic crisis will subsequently create a set of food insecurity challenges, even when the countries affected require no form of interventions before the pandemic (Schmidhuber *et al.*, 2020).

According to International Monetary Fund (IMF) Nigeria will witness a shrivelling growth by 5.4% in 2020, while the global growth rate is projected to be -4.9% in 2020. The report suggested that all regions of the world will witness a negative growth rate for the first time in 2020 (IMF, 2020). COVID-19 and the drop in crude oil prices will plunge the Nigerian economic into serious recession, just as National Bureau of Statistics (NBS) estimated an average recession measuring at about -4.4% in 2020 in the best case scenario, while the worst case estimated the growth to be around -8.9%. Where the country stimulates the economy, the growth is expected to be around -0.59%, in all the scenario the expectation is that poverty

among the people in the country will be triggered by the negative economic growth (NBS, 2020).

According to World Bank projection as the Nigerian economic contracts, the per capita income will as well fall due to the falling crude oil price and the COVID-19 pandemic thereby pushing additional 5 million people into poverty relative to pre-COVID-19 forecast (World Bank, 2020). The 2019 projection estimated that Nigeria has about 85 million people or 40.2% of the total population living below the poverty line, which translates into four people out of every ten people in the country. Million more are living just above the poverty line, and the pandemic tends to move those vulnerable into poverty, which is estimated at 4.9 million. More than 75% of the poors in Nigerian are residing in the Northern part of the country, most of which are predominantly traditional farmers (World Bank, 2020).

The impact of COVID-19 pandemic to Nigerian households is the inability of the households to generate income to meet up with basic needs in consumption. An estimated 1/3 of households in the country are predicted to be in an urban area are solely dependent on income generated from service as against agricultural sector mostly from the rural location. The pandemic has resulted in reducing 1 in 2 households overall food consumption, thereby affecting the food security status of the affected households in the country (NBS, 2020).

COVID-19 pandemic has presently affected both the food systems and the poverty level in the world in general and specifically in Nigeria. According to Zurayk (2020), the pandemic has presently affected all the four fundamental dimensions of food security negatively, namely accessibility, availability, utilization and stability. NBS (2020) stated that more than 83 million people in Nigeria are lower by National standard, while over 40% of the total population had real per capital expenditure less than N137,000 per year, while monthly income is less than N11,500 and daily income per day estimated at N38. Poverty headcount among the rural populace is estimated at more than 52% while that of urban is 18%. Kano has a poverty headcount of 55% above the national average (NBS, 2020).

COVID-19 pandemic even though is a lethal virus that has affected almost all human endeavour, including food security status, yet its empirical impact is still little as more and more researchers are now focusing on its impacts. Presently few studies concentrate on the impacts of COVID-19 and food security status in the world. Therefore, this study aims at accessing the impact of COVID-19 and food security status among households in Kano north.

## **2. Literature Review**

Deaton and Deaton (2020) empirically studied food security and Canadian agricultural systems threat by COVID-19 using the Canadian Community Health Survey (CCHS). The study discovers that even with the improvement in demand and supply chain coupled with the distribution chain. The result shows insignificant appreciation in the price of food, indicating low food supply in the future. In contrast, both intermediate and long term show a significant uncertainty due to the loss of life and sickness due to the world's COVID-19 pandemic.

Amare, Abay, Tiberti, and Chamberlin (2020), using spatial variation analysis, investigated the effect of COVID-19 on food security using panel data evidence from Nigeria. Findings reveal that households with higher cases of COVID-19 or agility lockdowns witnessed significant upward growth in food security challenges. Furthermore, finding reveal that labour market participation significantly reduces and food prices significantly increase due to the COVID-19 pandemic. The result also indicates a variation in the COVID-19 effect on economic activities and households. Households' experience of food security challenges increased with the introduction of lockdown measures by 12; while the tendency of taking part in non-business activities reduced by 13%. The impact of lockdown measures is smaller on wage-related farming activities. The finding also discovers that households depending on non-farm businesses, are poorer and more vulnerable households with school-aged children, and households residing in remote and conflict-affected areas witnessed a deteriorating food security challenge.

Dev and Kabir (2020) investigated COVID-19 and food security in Bangladesh, reflecting on what is done and what can be done. The study reveals that travel restrictions, lockdowns, and social distancing put in place for an extended time in Bangladesh take back food security achievement witnessed in the previous years. Finding furthermore reveals that while people considered food security achievement as a critical task, on the other hand, the COVID-19 pandemic is considered as a less critical challenge in Bangladesh.

Ahn and Norwood (2020) measure food insecurity during the COVID-19 pandemic of spring 2020 in the United States of America (USA). The result reveals that while there is little or no evidence of an increase in food insecurity level among the households, the percentage of households with children categorized as food insecure increased by about three percentage points more than that of the 2016 and 2017 investigation.

### **3. Methodology**

The study area is Kano State under the north senatorial district, which comprises about 14 Local Government Areas (LGAs) it is considered to be the most populous State in Nigeria. The study used primary data and adopted a random probability sample technique through a well-structured questionnaire among the 160 households. The sampling process first selected 4 LGAs from Kano north at random, comprising Dawakin Tofa, Gwarzo, Karaye, and Kunchi. Each of the LGA, four wards were selected randomly, and each ward produced a total of 10 households each. One of the eligibilities for participation is that the respondent must be the head of a regular household. In analysing the data, the study exploited the Food Security Index (FSI) and descriptive analysis.

FSI compares the household's calorie consumption measured against the recommended daily calorie requirement set by the FAO. To satisfy the index, two conditions need to be satisfied, namely the identification and aggregation. Aggregating involves aggregating the household calorie consumption into per capita calorie consumption for the entire members of each household and comparing it with the recommended energy requirement. On the other hand,

identification involves identifying and demarcating household members into infants, children, and adults to assign factor equivalent. Each of these groups of individuals has different consumption patterns. This demarcation will provide the adjusted household adult equivalent (Mukhtar, Kamaruddin & Applanaidu, 2018a). The conversion or adult equivalent for adjusted household use for this analysis is presented in Table 2.

**Table 2: Recommended Daily Energy Intakes and Equivalent Scale**

Age category (yrs)	Average energy per day	Factor equivalent
Children less than 6 yrs	813	0.3
Children (6 – 18) yrs	1,897	0.7
Adults (> 18) yrs	2,710	1.0

*Source: Mukhtar et al., (2018a).*

FAO (2016) recommended an average daily calorie requirement for a healthy Nigerian to be around 2,710 kcal per day. The figure of 2,710 kcal is enough for a normal human being to enable him to work and source income or generates income to feed his country's household. The country also has different foodstuff that has different calories. A table of such commonly eaten food in the country is used for easy analysis, as suggested by Oguntona and Akinyele (1995). Therefore, the FSI is given as follows.

$$\beta = \frac{\chi_t}{\alpha} \dots\dots\dots 1$$

$\beta$  represent food security index or household food status, which can either be food secure if the outcome is equal to 1 or more. While outcome less than one is defined as food insecure household,  $\chi$  is the per capita calorie or sometimes refers to the energy consumption of t household and the per capita recommended energy requirement set by FAO in a household, 2,710 kcal.

Surplus/shortfall ratio ( $\mu$ ) above or below from the threshold, which is defined by FSI as one (1) express in term of percentage (surplus index) or below the threshold (shortfall index), given as follows.

$$(\mu) = \frac{1}{\Omega} = \prod_{i=1}^m J \dots\dots\dots 2$$

$$J = \frac{\varepsilon - \mu}{\mu} \dots\dots\dots 3$$

Further substituting into Equation (2) will give Equation (4) below

$$(\mu) = \frac{1}{\theta} = \prod_{i=1}^m \frac{\varepsilon - \mu}{\mu} \dots\dots\dots 4$$

$\mu$  indicate the total number of households classified as food secure or food insecure, represent per capita calorie surplus or deficiency.

Various studies used FSI in determining the food security status of a household including the work of Mukhtar et al. (2018b); Mukhtar (2019a) Mukhtar (2019b) and Mukhtar (2020c).

#### 4. Results

Descriptive analysis from Table 3 reveals that out of 160 household heads, 93% of the household heads are male, while only 7% are female-headed households. The implication of a higher male-headed household is that the study area will be food secure as male household heads are more responsible in meeting up with the responsibility of providing food to the rest of the household members.

Table 3: Socio-demographic Characteristics of Household Heads

Details	Percentage	Average	Amount
<i>Gender Status</i>			
Male	93		
Female	7		
<i>Age</i>			
Classification of Age		40	
20-30	21		
31-40	26		
41-50	33		
50-above	20		
Non-school Children	49		
School Children	51		
Children Under 18 Years	56		
Adult Above 18 Years	44		
<i>Marital Status</i>			
Married	91		
Divorced	2		
Widowed	8		
<i>Household Size Classification</i>			
		10	
1-5 Individuals	24		
6-10 Individuals	35		
11-15 Individual	26		
16-20 Individuals	9		
21-above Individuals	6		

Source: Field Survey, 2020.

The average age among the household head is estimated at 40 years old; empirically, this is also another good sign that most household heads are within their productive age. More effort will be put into farming activities to improve food security status. Furthermore, classification in terms of age reveals that about 21% and 26% are with the age bracket of 20-30 years and 31-40 years, respectively. At the same time, about 33% and 20% of the household heads are within the age bracket of 41-50 years and 51-above. Marital status among the respondent's household heads from Table 3 reveals that the majority of about 90% are married, while 2% and 8% are divorced and widowed, respectively. There is a high number of married household heads in the study area. This is also another indication that

the area tends towards being food secure since one of the obligations of a married household head is to put food on the household's table daily. Household size, on the other hand, can affect the food security status of a household. The expectation is that a high number of household can significantly affect the food security status, especially the household embers are unproductive than a household with fewer household size and productive members. Table 3 reveals that the study area's average household size is estimated to be ten individuals per household. Household size classification from Table 3 reveals that about 24% and 35% are within the family size bracket of 1-5 individuals and 6-10 individuals, respectively. At the same time, about 26%, 9%, and 6% are within the family size classification of 10-15 individuals, 16-20 individuals, and 21-above individuals. Furthermore, Table 3 reveals that 56% of the family size are school children, while 44% are above 18. About 51% of the family size are non-school children and classified as an unproductive element of the family size.

Household classification from Table 4 reveals that 59% are farming households, while about 41% of the household heads are non-farming households in the study area.

Table 4: Socio-economic Characteristics of Household Heads

Details	Percentage	Average (#)
<i>Household Classification</i>		
Farming	59	
Non-Farming	41	
<i>Educational Qualification</i>		
Non-formal	20	
Primary School Certificate	42	
Secondary School Certificate	32	
Higher Education Certificate	6	
<i>Occupation</i>		
Private	25	
Public	35	
Farming	40	
<i>Income and Expenditure</i>		
Average Monthly Expenditure		112,830
Average Daily Expenditure		3,760
Average Monthly Income		113,500
Average Daily Income		3,783

Source: Field Survey, 2020.

Table 4 reveals that the educational qualification among the household heads is non-formal and primary education. About 20% of the household heads have non-formal education, and that majority or about 42% have first leaving school certificate, which is primary education. About 32% have a secondary school certificate, while only 6% have a higher education certificate, mostly at Diploma level and Bsc. The implication here is that most household heads have a low level of education which can have negative impact on their ability to generate more income, capacity job opportunities, and technological innovations in the farming

sector. This can easily result in a reduction of household heads' ability to be food secure. In terms of occupational jobs, Table 4 reveals that about 25% are into private business while about 35% and 40% are into public sector and core farming activities, respectively. Average monthly expenditure for the households in the study area is estimated to be around N112,831, with over 90% of the amount going for food expenditure and only 10% for non-food expenditure. This presents a negative signal since most of the expenditures will be consumed, and investment is seriously dropping below expected, with lack of savings by the study area's household heads. A further breakdown from Table 4 reveals that the household's average daily expenditure is estimated at N3,760. Table 4 further reveals that the household heads' average income is N113,500, while the daily average income is estimated to be around N3,783 among the household heads.

Table 5 reveals the pre-COVID-19 food security index from Kano north. The table shows that an estimated 52% of the households were food secure, but 48% were food insecure. The food security index in Kano north before COVID-19 was 0.7 indicating a severe food insecurity status overall in the study area; Total Calorie consumption among households was 2,056,219kcal, while the total calorie requirement was 3,147,460kcal. Per capita calorie consumption and requirement were 1,881.5kcal and 2,711kcal, respectively, in Kano north. Total adult equivalent in the study area was 1,161 from total households of 165. This outcome revealed a food security index of 0.7, which is below the threshold of 1. The outcome revealed that even though the study area has a high percentage of its households classified as food secured, which was estimated at 52%. The number of households classified as food insecure had a colossal calorie requirement due mainly to household sizes no need.

In contrast, Table 6 shows a food security index of the same location from the same local government, just as in Table 5. However, analyses were carried immediately after the lockdown suspension to ascertain whether households are food secure or not due to the COVID-19 pandemic. Table 6 reveals that about 62% of the households were food insecure due to COVID-19 as against the 48% pre-COVID-19 pandemic. Therefore, an additional 14% of households were pushed into food insecurity status during the pandemic. This is in line with FAO's findings (2020), which stated that over 7 million individuals were pushed into severe food insecurity status due to the COVID-19 pandemic. The table furthermore reveals that total households' calorie consumption in the study area is 1,832,200 kcal clearly less than 2,056,200 kcal, which means there is also a reduction of calorie consumption among the households in the study area, and one of the reasons for such is the reduction in income generation capacity of the household heads especially when the lockdown measures was put in place by the government. Also, it was observed that some household heads also lost their job especially those employed by the private sector in the study area, while all the household heads recorded a reduction in income during the lockdown period. Total households' calorie requirement slightly increased from the pre-COVID-19 figure of 3,147,460 kcal mostly because there is an increase in the adult equivalent during COVID-19 pandemic as against the pre-COVID-19. It also means that some of the children that were considered



underage have grown from the previous study and are now adults who take full-calorie requirement of 2,710 kcal as suggested by FAO.

Table 5: Food Security Index among Households in Kano North Pre-COVID-19

Percentage of Food secure Households	52
Percentage of Food Insecure Households	48
Total Calorie Consumption	2,056,219.00
Total Calorie Requirement	3,147,460.00
Per capita Calorie Consumption	1,881.50
Per capital Calorie Requirement	2,711.00
Total Adult Equivalent	1,161.00
Food Security Index	0.70
Short fall Index	0.33

Source: Mukhtar et al., (2018a)

Table 6 further reveals that the food security index during COVID-19 is estimated at 0.60, deterioration from the pre-COVID-19 index of 0.7. This suggests a much-worsening food security status among the households in the study area. Per capita energy consumed or calorie consumption is 1,558 kcal, clearly, below the per capita energy or calorie requirement of 2,710kcal and a low figure compared to pre-COVID-19 per capita energy consumed 1,881.50kcal. The total adult equivalent in the study area during the lockdown is 1,176 against the pre-COVID-19 of 1,161. The family size will most likely increase in the next few months, which will also spell trouble in terms of food security status as most household heads reveal the possibility of an unplanned pregnancy.

Table 6: Food Security Index among Households in Kano North During COVID-19

Percentage of Food secure Households	32
Percentage of Food Insecure Households	62
Total Calorie Consumption	1,832,219
Total Calorie Requirement	3,247,460
Per capita Calorie Consumption	1,558
Per capital Calorie Requirement	2,761
Total Adult Equivalent	1,176
Food Security Index	0.60
Short fall Index	0.40

Source: Fields Survey, 2020

Further disaggregation of food security status into income classification, educational qualification, and family size as revealed in Table 7 suggests that in terms of household income classification, about 20% of the food secured households are within the income classification of N10,000-N100,000. In comparison, the majority or about 70% of these under the income level are classified as food insecure. This shows the significant impact lost of money has on food security especially during the lockdown period. Similar findings also show how income and conflict can easily trigger food insecurity among households in Kano (Mukhtar 2019d; Mukhtar 2020a; Mukhtar 2020b). For households under the income classification of N101,000 - 200,000, about 41% are classified as food

secure, while only 29% are food insecure. In the same vein, about 39% of the food secure households are food secure, and only one percent are food insecure. This is an indication that the higher the household income, the higher its food security status. In terms of educational qualification, Table 6 reveals that the majority or about 65% of the households classified as food insecure have low educational qualifications ranging from informal to primary school certificate.

In comparison, about 35% and 47% of the households have middle and high educational qualifications. The implication here is that with higher educational qualifications, food security status is expected to increase. Furthermore, Table 7 reveals that about 48% of the food secure households have a family size of 1-10 individuals; about 22% of the food secure households have a family size of 11-20 individuals. In comparison, about 30% have a family size of 21-above as food secure.

Table 7: Disaggregation in Households' Income, Education and Family Size into FSI

Descriptions	Food Secure	Food Insecure
<i>Income Level</i>		
N10,000-N100,000	20	70
N101,000-N200,000	41	29
N201,000-above	39	1
<i>Educational Qualification</i>		
Low Education	18	65
Middle Education	35	25
Higher Education	47	10
<i>Family Size</i>		
1-10 Individuals	48	25
11-20 Individuals	22	38
20-above Individuals	30	37

*Source: Fields Survey, 2020.*

### **5. Conclusions and Recommendation**

The study compares the food security status among households in Kano north pre-COVID-19 and during lockdown measures during the onset of COVID-19. Descriptive analysis reveals that there are 160 household heads respondent that participated in the survey, almost the same number with the previous survey conducted in 2018 before the COVID-19 pandemic. About 93% and 91% of the respondents are male and married respectively; about 62% have a low educational background ranging from non-formal education and primary school certificate. In comparison, about 59% of the households are farming households in the location. The average age among the household heads is estimated around 40 years which indicate an active and productive household head and average family size is estimated to be around ten individuals per household, with at least six children under the age of 18 years and four adults. In terms of monthly expenditure, average monthly expenditure among the households is estimated at N112,830, while monthly income generation among the households is estimated at N113,500. The

pandemic has resulted in forcing the households to rely on the little saving, thereby affecting the investment in the study area.

Statistical evidence reveals that households' food security status has deteriorated immediately after the onset of the pandemic with many more households reducing or cutting back with their food intake as a means of coping with a pandemic that comes along with so many economic consequences. Other economic variables also combine with the pandemic to influence the food security status. The result from the FSI reveals an index less than the threshold of 1, indicating that even before the pandemic; the study area is facing severe food security challenges. The result indicates that in 2018 the FSI is 0.7 while the new FSI is 0.60 suggesting a deteriorating food security status. The pre-COVID-19 result shows that about 52% of the households were food secured, while result from the analysis from the COVID-19 shows that only 32% of the households are food secure. The result, therefore, indicates a severe problem with food security status in the study area. Total calorie consumption pre-COVID-19 was 2,056,219 kcal revealing a severe reduction during the COVID-19 of 1,832,200 kcal. There is little or no significant difference in calorie requirement between pre-COVID-19 and during COVID-19 since it is fixed. The analysis shows a significant difference between per capita calorie consumption in the two-period with pre-COVID-19 higher than that of COVID-19.

Clearly, the result shows that food security is a severe challenge in the study area, the government is therefore strongly advised to invest in a project that is pro-poor project like agriculture will go a long way since majority of the households are engaged in agricultural activities. The study also observed that the impact of the government palliative had not touched the grass-root with many poor households left without any significant assistance to alleviate the suffering during the lockdown measures. Lockdown measures need to be softened to the farmers instead of stopping them from going to the farm. The government should encourage putting of face masks and maintaining a social and physical distance during and after farming activities.

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## The effect of Managerial Ownership on Dividend Payout of Listed Diversified Conglomerates in Nigeria

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### Abstract

*Theoretically, dividends payments are irrelevant and have no influence on the market value of shares. Thus, a firm can essentially avoid distributing cash (or at least defer payouts for a very long time). But the practices in Nigerian firms are different as some of the companies distribute entire earnings while some retain the entirety. To investigate the rationale of paying dividend, this paper examines the effect of managerial ownership on dividend payout of listed diversified conglomerates in Nigeria. Using annual reports of six (6) firms registered as conglomerates companies on the Nigerian Stock Exchange (NSE) for a period of 10 years (2005-2014). Using panel regression analysis, the study found that managerial ownership had significant relationship with dividend payout for the period examined. The study concludes that managerial ownership has significant positive relationship with the dividend payout of the listed diversified conglomerates in Nigeria. The study recommends that constituents stakeholders such as regulators and investors should encourage managerial ownership in the listed diversified conglomerates in Nigeria as this could improve the efficiency and control over the managers, by reducing the agency problem..*

**Keywords:** Corporate; Firms; Managerial, Ownership; Structure

**JEL Classification:** H32, L22, M14

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### 1. Introduction

Dividend policy has been an issue of interest in financial literature since the separation of ownership from control, which led to the formation of Joint Stock Companies in the corporate world (Kapoor, 2009). Dividends are the distribution of earnings (distributable income) in real assets among the shareholders of the firm in proportion to their ownership. The process that determines how much and in which way profit is distributed among shareholders is called dividend policy. In addition, dividend policy relates to the payout policy, which managers pursue in deciding the size and pattern of cash distribution to shareholders over time. Shareholders' wealth maximization has been the managements' primary goal, which translates into maximizing the value of the company as measured by the price of the company's

common stock. This goal can be achieved by giving the shareholders a “fair” payment (in form of dividends) on their investments.

Indeed, dividend policy is one of the most complex aspects in finance, and as such corporate dividend policy has attracted attention of management scholars and economists resulting into theoretical modeling and empirical examination (Kapoor, 2009). For instance, firms generally adopt dividend policies that suit the stage of their life cycle; high-growth firms with larger cash flows and fewer projects tend to pay more of their earnings out as dividends. Consequently, dividend policy of a firm has implication for investors, managers and lenders and other stakeholders (Kapoor, 2009).

For investors, dividends whether declared today or accumulated and provided at a later date are not only a means of regular income, but also an important input in valuation of a firm. Similarly, managers’ flexibility to invest in projects is also dependent on the amount of dividend that they can offer to shareholders as more dividends may mean fewer funds available for investment. Lenders may also have interest in the amount of dividend a firm declares, the more the dividend paid, the less would be the amount available for servicing and redemption of their claims. The dividend payments present an example of the classic agency situation as its impact is borne by various claimholders. Accordingly, dividend policy can be used as a mechanism to reduce agency costs. Moreover, the payment of dividends reduces the discretionary funds available to managers for perquisite consumption and investment opportunities and requires managers to seek financing in capital markets. This monitoring by the external capital markets may encourage the managers to be more disciplined and act in owner’s best interest (Afza & Miraza, 2010; Nyor & Adejunwo, 2013).

However, a major problem in respect of dividend payment is the reasons for adopting a policy of dividend payout; because dividend policies depend on several factors, and one of these factors is corporate governance (Mehrani, Moradi & Eskandar, 2011). According to them, corporate governance has recently received considerable attention due to the financial scandals. Gillan and Starks, (2003) added that among the reason for the attention is the interest conflicts among shareholders in the corporate structure. That is, differences exist between the shareholder types and the demand for dividend (Truong & Heaney, 2007).

For instance, among shareholder types, institutional shareholders and managerial shareholders have a greater influence on firm policies. On this strength, corporate ownership structure is considered as an influential factor on firm policies, and one of these policies is dividend policy. Thus, the relationship between a firm’s dividend policy and its ownership structure is recognized in the established literature (Short, Zhang, & Keasey 2002; Mehrani, Moradi & Eskandar, 2011).

Moreover, corporate governance changes in Nigeria have been common in recent times and had led to high level of institutional ownership and managerial ownership, especially in the diversified conglomerates firms. These category of investors play a key role in prompting change in many corporate governance systems and they usually affect the critical policies like dividend policies. For

instance, managerial ownership and dividend policies have been well documented; as Jensen (1986) propagated free cash flow theory which suggests that managers are reluctant to pay out dividends, preferring instead to retain resources under their control. Similarly, block shareholders according to Shleifer and Vishny (1986), creates the incentives to monitor management, which overcomes the free-rider problem. Mitton (2005) showed that firms with higher block ownership pay higher dividends. Baba (2009) observed the influence of foreign investor's ownership on the dividend payout policy of the firms of Japan and the study further showed that higher foreign investor's ownership is related with the higher dividend policy of firm.

This study is therefore motivated by the fact that, dividend policies vary across countries and across firms (Laporta, Lopez-de-Silanes, Shleifer, & Vishny, 2000). In addition, prior researches suggested significant differences in dividend policy between developed countries and developing countries (Abdelsalam, El-masry, & Elsegini, 2008). According to this argument, corporate governance practices including ownership structure are affected by environmental characteristics. As such, the relationship between ownership structure and dividend policies is expected to be different in various environments and countries. To present a contextual perspective on the ongoing debate on dividend policy, the present study focuses on the relationship between dividend policy and ownership structure using sample of diversified conglomerates companies in Nigeria. Given the major regulatory and governance structural changes, Nigeria presents an interesting context. Thus, providing empirical evidence on dividend policy and ownership on area largely unexplored, this paper contributes to and extends the dividend policy literature. The remainder of this paper is organized as follows: section two presents the review of related works and hypothesis development. Research method is presented in section three. Section four presents findings; and section five is the conclusion of the study.

## **2. Literature Review**

Ownership structure reflects the distribution of control in the firm. By controlling the firm, an investor controls or strongly influences the dividend payout policy. Berzins, Bohren and Stacescu (2011) measured the potential conflict between minority and majority shareholders through the ownership concentration reflected by the shareholdings of the largest personal, family, industrial or institutional owning entity. As they focus their attention on private firms and the second agency problem described by Villalonga and Amit (2006), they include firms with a concentrated ownership defined by shareholdings of the largest owner exceeding 50% including indirect ownership. Their findings support the aligned incentives hypothesis rather than the conflict of interest hypothesis discussed by Thomsen (2005) or the substitution model rather than the outcome model described by La Porta, Lopez and Shleifer (2000). Hence, the dividend payout ratio increases with ownership concentration. For a sample of UK-firms, this view is partially supported by the findings of Short, Zhang and Keasey (2002).

What constitutes ownership structure varies among different authors. Zhang (2005) define ownership structure as stockholders ownership proportion. It can also



represent the concentration degree of ownership in firms, which means large shareholders proportion in a firm. In addition, Zhang (2005) further reiterated that there are three types of ownership structure. First, absolute concentration of ownership, there is only one stockholder who has the absolute power to control the firm and usually keep 50% ownership; Second, absolutely dispersed ownership, there are numerous stockholders; there is complete separation of ownership and control where single stockholder keeps share below 10%. Third, there coexist relative concentration of ownership and some large shareholders in a firm. However, in a firm with a relative concentration of ownership and some large shareholders, ownership structure can almost decide the composition of the board. It is always assumed that only shareholders who hold large shares may closely monitor the management of the board. Dispersed shareholders have little or no incentive to monitor the management; they may have no power to decide who make the composition of board members. Then, some large shareholders control the exercise of the board. They may use their voting power to improve their own position at the expense of other shareholders. Chen, Gul and Tsui (2003), claimed that managerial ownership may be divided into two: insider ownership and outsider ownership. The insider ownership is defined as a percentage of share held by the insider board members including executive directors and non-independent directors while outside board ownership is defined as a percentage of share held only by independent non-executive directors. Following Harada and Nguyen (2009), short, Zhang and Keasey (2002), and Karathanasis and Chrysanthopolou (2005), managerial ownership refers to the total percentage of equity held by the shareholders that take part in the companies' management, either through their natural presence or representation in the Board of Directors, or through the undertaking of managerial tasks or through a combination of the two.

Several studies were conducted to find the relationship between ownership structure and dividend policy from different jurisdictions. However, the results are mixed and inconclusive to inform policy and decisions. For instance, Laporta et al., (1999), Claessens, Stijin, Simeon and Larry (2000), Faccio, Mara, Larry, and Leslie (2001), In their study outside the US and UK, many public listed companies located in other area have high concentration ownership, with some largest shareholders controlling the companies. The concentrated ownership will affect the firms' performance and the company policy and there are different results in many countries about relationship between concentrated ownership and dividend policy. Easterbrook (1984) also proved that dividend can be substituted for shareholder monitoring, or higher dividends can reduce agency conflicts because majority of shareholders have strong motivation to require higher dividend payments in order to mitigate their expense. Therefore ownership concentration should positively associate within dividend policy. Jensen, Solberg & Zorn (1992) examined that there is a significantly negative relationship between insiders and dividend policy among US companies this relationship also appeared in UK firms. Farinha (2003) In Hong Kong, Chen, Cheung, Stouratisandwong (2005) have found that dividend payment is lower when several indicators of governance quality are higher. Guguer and Yurtoglu (2003) present that the dividend payout is lower when majority shareholders control a company in Germany because of the extraction for private

purposes by controlling shareholders. In addition, in Finland, Maury and Pajuste (2002) showed that there is negative relationship between ownership concentration and dividend policy. On the other hand, following Harada and Nguyen (2009), Short *et al* (2002), and Karathanasis and Chrysanthopolou (2005), managerial ownership refers to the total percentage of equity held by the shareholders that take part in the companies' management, either through their natural presence or representative in the Board of Directors, or through the undertaking of managerial tasks or through a combination of the two. Manos (2002), Short *et al* (2002) Harada and Nguyen (2009), find a significant negative relationship between dividend and percentage ownership held by the shareholders that take part in the company's management, either through their natural presence or representation in the Board of Directors, or through the undertaking of managerial tasks or through a combination of the two.

Musa (2009) used the parsimonious multiple regression model developed by Musa (2005) to investigate the dividend policy of a cross-section of 53 firms quoted on the Nigerian Stock Exchange (NSE) during the period 1993 to 2002. The model employs five metric variables-previous dividend, current earnings, cash flow, investment and net current assets, and three non-metric variables- growth, firm size and industry classification, in order to explain as well as predict the dividend policy of quoted firms in Nigeria. The empirical results reveal that the five metric variables have significant aggregate impact on the dividend policy of the quoted firms. However, three of the variables-current earnings, previous dividend and cash flow, have been found to be robust in the model. Finally, the tests find that none of the three non-metric variables provides a statistically significant improvement to the base model. Mancinelli and Ozkan (2006) also carried out a study on ownership structure and firms dividend policy using 139 Italian firms. The regression results support the prediction that higher level of ownership concentration is associated with a higher probability of expropriation of outside shareholders. There are private benefits to the large shareholders of holding cash as lower dividend payouts will increase the ability of the large shareholders to expropriate the outside majority shareholders. Their findings also support the prediction that managers prefer to hold resources under their control rather than distributing returns to shareholders. Matnor and Sulong (2007) also empirically examined the relationship between various forms of ownership structure and dividends in Malaysia. 406 firms were studied using a multiple regression analysis for the period 2002 to 2005. Their results revealed that ownership concentration has a significant positive impact on dividends though with minimum impact. However, managerial ownership was seen to be significantly positively related to dividends which imply that insider shareholdings provide greater incentives for the alignment of management and shareholders interest resulting in higher dividends. The results also suggest that managerial ownership does not play an active role in Malaysia. Ramli (2010) in his study investigates the effect of large shareholders and dividend policy of Malaysian firms using panel data from 2002 to 2006. They found out that firms make higher dividend payout as the largest shareholder increase and the magnitude of dividend payout is also larger when there is a presence of the substantial second largest shareholder in the company.

Grossman and Hart (1988) argued that there is a positive relationship between ownership concentration and dividends, leaning on the preference for the allotment of these large shareholders which are usually companies. Furthermore as concluded by Faccio, Lang and Young (2001) in their study on ownership concentration and dividend policy of European firms, the presence of multiple owners might alleviate expropriation of minority shareholders by the controlling shareholder. However, they found that the presence of multiple large shareholders helps to limit the expropriation of minority shareholders by the controlling shareholders. This therefore implies a negative relationship between ownership concentration and dividend payouts. According to Shleifer and Vishny (1997), large shareholders have a dual impact on firms. On one hand is their incentive to monitor the manager's activities and on the other hand is to extract rents and enjoy private benefits of control. In line with this argument, the literature offers two competing views about the relationship between ownership concentration and dividend policy of firms. Firstly, the expropriation hypothesis predicts that the high level of ownership concentration increases the propensity for expropriation of minority shareholders by large shareholders and that controlling shareholders with substantial power adopt a policy that retains a larger amount of earnings they can expropriate, thereby resulting in low payout. Secondly, the substitution hypothesis is based on the assumption that firms need to raise external funds, and in order to sustain outside equity in the firm, the controlling shareholders usually establish a reputation for not expropriating wealth from minority shareholders by paying out more dividends.

Harada and Nguyen (2006) examined the impact of ownership concentration on the dividend policy of Japanese firms from 1995 to 2002. In line with the findings of Khan (2006), they also found out that firms with high ownership concentration pay lower dividends. Tightly controlled firms are less likely to increase dividends when profitability increases and when operating profits are negative. This pattern is consistent with their lower payout and the assumption that the dominant shareholder extracts private benefits from resources under their control. They also found that tightly controlled firms are more likely to omit dividends when investment opportunities improve which protect the interest of current shareholders. A related study was also conducted by Maury and Pajuste (2002) to determine the relationship between controlling shareholders and dividend policy of listed firms in Finland. From their findings, it could be deduced that dividend payout ratio is negatively related to the control stake of the controlling shareholder. However, their results support the mitigating role of another shareholder since the cumulative ownership of the three largest shareholders has a negative impact on dividend payouts. Additionally, Klein (2002) examined the effectiveness of characteristics of the board and the composition of the audit committee, while controlling the effects of ownership concentration. To measure the effect of block-holders on dividend policy, she looked at firms whose audit committees include representatives of block-holders with more than 5% of the equity. She found a negative relationship between 5% block-holders sitting on audit committees and dividend policy.

Gugler and Yurtoglu (2003) analysed dividend payout of German firms with a special focus on the large-small shareholder conflict. Their results show that the markets react more negatively when large uncontrolled shareholders reduce the dividends they intend to pay out to minority shareholders. They concluded that dividend payout levels decrease in the power of the largest shareholder but increase in the power of the second largest shareholder. Mancinelli and Ozkan (2006) examined the relationship between ownership concentration and dividend policy of 139 listed Italian firms. The results of their analysis showed that firms make lower dividend payout when the voting rights of the largest shareholder increases and it was further argued that the presence of agreements among the large shareholders might explain the limited monitoring power of other strong non-controlling shareholders. A similar study was conducted by Ramli (2010) to investigate the impact of large shareholders on the dividend policy of Malaysian firms from 2002 to 2006. Since the ownership structure in Malaysia is usually concentrated, the relevant agency conflicts to analyse are usually that which arises from the relationship between large shareholders and minority shareholders. His results reveal that companies make higher dividend payout as the shareholding of the largest shareholder increases and the magnitude of the dividend payout is also larger when there is a presence of the substantial second largest shareholder.

Zeckhauser and Pound (1990) suggest the arm's length view of investment held by many institutional investors, coupled with the incentives to free ride with respect to monitoring activities, implies that institutional shareholders are unlikely to provide direct monitoring themselves. The institutions, rather than providing monitoring themselves, force firms to increase their dividends in order that they are subsequently forced to go to the external capital market for future funds.

D'Sauza and Saxena (1999) also examined the effects of institutional investors on an international firm's dividend policy. A sample of 349 firms was used to determine the relationship between dividend payout and institutional ownership. The dividend policy of a firm was defined as its dividend payout ratio (the ratio of dividend per share and earnings per share) while the percentage of institutional holdings of a firm's common stock was used as a proxy for institutional ownership. Multiple regression analysis was performed and the results revealed a statistically significant and negative relationship of dividend payout with the explanatory variable institutional shareholdings.

An important body of literature exists on how ownership structure influences dividend policies. Especially the link between managerial ownership and dividend policy has been well documented (Wiberg, 2008). Most of these studies have argued that dividend payout is generally viewed as a control device which helps reduce managerial discretion, and as such, it is part of the firm's optimal monitoring. That is, the agency control function of dividend payout is linked to the severity of the manager-shareholder conflict. Rozeff (1982) in his research on growth, beta and agency costs as determinants of dividend payout ratios suggests a negative relationship between managerial ownership and dividends. This means companies with more managerial participation tend to pay lower dividends. This shows that insider ownership provides direct incentives of alignment between

managers and shareholders while dividends serve as a mechanism that reduces the manager's propensity to make unprofitable investments out of internally generated funds. Jensen (1986) free cash flow theory suggests that managers are reluctant to pay out dividends, preferring instead to retain resources under their control. Their evidence shows that dividends decreases with an increase in the voting powers of owner-managers, and is almost zero when owner-managers have absolute control. The extent of the role played by managerial ownership in relation to proportion of shares held by management may affect control over the firm's decision. Jensen and Meckling (1976) theorize that as managerial ownership increases, when their interest was closely aligned with the owners (principal), the need for intense monitoring will reduce. Also in the public equity firms, to reduce the managers' (agent) incentives in expropriating the shareholders wealth, managerial equity ownership serves to align interests of managers with those of shareholders and thus increase firm value. The managers and directors of the company may face takeover threat from the shareholders, if managerial equity ownership increases; it would result to entrenching effect of managers. These can reduce takeover threats that the managers face whenever their performance or that of the directors are below expectation (Stulz 1988).

Eckbo and Verma (1994) empirically showed that dividend payout decreases with the increasing power of managerial share ownership and also argued that in the managers-controlled firms where they have absolute voting power, the cash dividend is zero. They conjectured that observed dividends resolves shareholder conflicts by a consensus across heterogenous shareholder groups. This consensus-dividend hypothesis was tested using firms in Canada where the managers own majority of the shares. The empirical evidence indicates that cash dividends decrease as the voting power of owner-managers increases, and are almost zero when owner-managers have absolute voting control of the firm. Agrawal and Jarayaman (1994) used the sample of all-equity and levered firms which consists of 71 matched pairs. All equity firms are defined as those who use short term debt throughout a continuous five year period. Their results indicate that dividend yields and dividend payout ratios of all-equity firms are significantly higher than those of levered firms. They also discovered that within the group of all-equity firms, firms with higher managerial ownership have lower dividend payout ratios because they substitute mechanisms for controlling the agency costs for free cash flow.

Moreover, Hansen, Kumar and Shome (1994) test the relevance of monitoring theory for explaining the dividend policies of regulated electrical utilities. They focused on this industry partly because relative to industrial firms, utilities are more insulated from the discipline of other monitoring mechanisms for controlling agency costs. Their findings revealed that utilities faced with higher regulatory and managerial conflicts pay proportionally greater dividends. Their findings are consistent with the monitoring hypothesis that these utility firms use dividend induced equity financing to control agency costs that arise out of the shareholder-regulator and shareholder-manager conflicts. Mohammed, Perry and Rimbey (1995) also employed panel data on three hundred and forty one US firms over 18 years from 1972 to 1989 using weighted least squares regression to examine the

effect of managerial ownership on dividends. The result of their findings revealed that higher dividend payouts are observed when managers own a lower percentage of shares and the outside ownership becomes more dispersed. Yordying (2013) study examines the relationship between *ownership* structure and dividend policy in Thailand in a sample of 1,927 observations. The results show that Thai firms are more likely to pay dividends when they have higher ownership concentration or the largest shareholder is an institution and that firms pay higher dividends when the largest shareholder, especially an institution, holds more percentage of shares. It also found that the likelihood of paying dividends and the magnitude of dividend payouts increase (decrease) with higher institutional (individual) ownership. Xuanfeng (2014) study examines how ownership structure affects dividend yield using firm size, profitability, leverage, and firm development opportunities as control factors. The result reveals that ownership structure and profitability has the most important effect on dividend yield. Firm size also determines the dividend payout but in negative relationship. It suggested that firm leverage and market-to-book showed no significant influence on dividend policy.

Ojeme, Namidu and Ojo (2015) empirically examine the implications of adopted dividend policies on the value of shareholders' wealth and the extent to which dividend policy affects the market value of shares in quoted banks in Nigeria. The paper focuses on the situation before and after the financial meltdown. Correlation results of dividend paid in 2007-2010 and their corresponding market value showed that payment of dividend by quoted banks is relevant to their market value and the amount paid as dividend affects the value of their share.

Felix and Domingo (2015) study examine the effect of shareholder coalitions on the corporate payout policy in Spain, a context characterized by the presence of dominant shareholders. The results show that shareholder coalitions affect payout policy negatively (both for dividends and shares repurchases). This finding suggests that shareholder coalitions serve as an instrument for the dominant shareholder's to extract private benefits. It also find that the relation between the voting rights involved in the coalition and the dominant owner's voting rights is negatively related to dividends. Al-Qahtani and Ajina (2017) examined the relationship between the ownership structure and dividend payout policy for 100 firms listed on Saudi Stock Market for the period 2012-2015. The results indicated a positive relationship between managerial ownership and dividend. Wei et al. (2017) examined the impact of ownership concentration on dividend payout of Malaysian publicly listed firms for the period 2005-2015. The results indicated that ownership concentration was associated with low dividend payout. Le and Le (2017) investigated the relationship between the identities and level of shareholdings of the largest shareholders, and cash dividend policy of 180 firms listed on Vietnam stock exchange markets for the period 2009-2013. The results indicated that the firms with foreign investors as the largest shareholders had higher dividend payout ratio than firms with domestic investors as the largest shareholders. The results also indicated that the higher the level of holdings, by the largest shareholders, the lower the dividend payout.

3. Methodology

The population of the study comprises of all the six (6) diversified conglomerates listed on the floor of Nigerian Stock Exchange (NSE) as at 31<sup>st</sup> December, 2014, and are operating during the period of the study (2005-2014). The census sampling technique in which all the population members participate in the experiment will be applied; hence the sample size of the study is six (6). The study made use of secondary sources of data through the income statement, the statements of financial position and non-financial information of all the sampled diversified firms. The choice of secondary data is informed by the quantitative research methodology adopted for the study.

The study employed panel multiple regression technique of data analysis for the study. This technique is considered because of its effectiveness in estimating the relationships as well as the impact of one variable on another variable. However, in view of the classical regression assumptions, the study tests to see whether the variance of the error term is constant and the same for all observations (homoscedastic) which is not usually the case for panel data as a result of time-variant and heterogeneity of the units that form the panel. Similarly, the study test the problem of multicollinearity. If the independent variables are perfectly correlated, this biases the regression estimators. However, when these effects are addressed, the regression result is capable of producing estimators that are best linear unbiased estimators (BLUE). The model of the study was subjected to robustness tests, to ensure that the result is not biased and can provide fitted coefficients to achieve the objectives of the study

Variables Measurement and Model Specifications

The variables of the study are dividend policy (proxy by dividend payout ratio) and the independent variables, corporate ownership structure (managerial shareholding). There are also variables controlling for growth opportunities, performance and firm size.

To examine the impact of corporate ownership structure on the dividend policy of listed diversified firms in Nigeria, the study estimate the following econometric model;

Dividend Payout Ratio = f (Managerial Shareholding) ..... 1

That is, dividend payout is a function of ownership structure; managerial shareholding. In order to account for other factors that determine corporate dividend policy, we introduced three variables to control for performance, growth opportunities and firm size.

The model of the study is mathematically expressed as follows;

DivPOR<sub>it</sub> = β<sub>0</sub> + β<sub>1</sub>MgrShldng<sub>it</sub> + β<sub>2</sub>Perform<sub>it</sub> + β<sub>3</sub>GrwthOpp<sub>it</sub> + β<sub>4</sub>Fsize<sub>it</sub> + ε<sub>it</sub>..... 2

Where DivPOR<sub>it</sub> is dividend payout ratio of firm i in year t, MgrShldng<sub>it</sub> indicates managerial shareholding of firm i in year t, Perform<sub>it</sub> represents performance of firm i in year t, GrwthOpp<sub>it</sub> is the growth opportunities of firm i in year t, Fsize<sub>it</sub>

consist of size of firm  $i$  in year  $t$ ,  $\varepsilon_{it}$  is the residual/error term, and  $\beta_1$ , is the variable of interest while  $\beta_2, \beta_3, \beta_4$ , are control variables,  $\beta_0$  is intercept.

**4. Results**

*Descriptive Statistics*

The descriptive statistics of the data collected for the study are presented and discussed in this section, the summary of the descriptive statistics is in Table 4.1 as follows;

Table 1: Summary of Descriptive Statistics

Variables	Mean	SD	Min	Max	Skew	Kur	N
DVPOR	0.2637	0.2581	0.0000	0.9371	0.8616	2.9962	60
MGRSH	0.1076	0.1729	0.0008	0.4760	1.5276	3.6298	60
PERF	0.0174	0.1455	-0.5300	0.5313	-0.9979	9.5981	60
GRWOP	0.0167	0.3474	-1.0901	0.6288	-1.4403	5.4264	60
FSIZE	16.688	1.2582	14.3325	18.9572	0.2475	2.0791	60

*Source: Authors Computation*

The descriptive results in Table 1 show that our measure of dividend policy, dividend payout ratio (DVPOR) has an average value of 0.2637 with standard deviation of 0.2581 and minimum value of 0 and 0.9371 as maximum value. The mean value indicate that the diversified firms’ dividend payout ratio is 26.37% (73.63 retention policy), and the standard deviation of 0.2581 signifies that the ratio deviate from the mean value from both sides by 25.81%, implying that there is a wide dispersion of the data from the mean because the standard deviation is large compared with the mean value. The minimum and maximum dividend payout ratios of the firms are 0% and 93.71% respectively. This indicates a non-payment policy and almost a 100% pay-out policy during the period covered by the study. The coefficient of skewness of 0.8616 suggested that the data is positively skewed (did not follow the normal distribution), while the kurtosis coefficient (2.9962) also implies a moderate peakedness in the distribution.

The results also indicate that the average managerial shareholding (MGRSH) in the listed diversified conglomerates in Nigeria is 0.1076 with standard deviation of 0.1729, and minimum value of 0.0008 and 0.4760 as the maximum value. This suggests that the average equity shareholding by the managements of listed diversified conglomerates in Nigeria during the period of the study is 10.76% and the deviation from the mean 17.29%, while the minimum and maximum managerial shareholdings are 0.08% and 47.60% respectively. The value of skewness 1.5276 suggested that the data is positively skewed (did not follow the normal distribution), and the kurtosis coefficient (3.6298) also implies that the data is not normally distributed.

Table 1 shows that the average firm performance (PERF) in the listed diversified firms in Nigeria is 1.74%, from the mean value of 0.0174 with standard deviation of 0.1455, and minimum value of -0.5300 (loss 53%) and 0.5313 (53.13%) as the maximum performance. The standard deviation suggests that the performance deviate from the mean value by 14.55%. The skewness coefficient of -0.9979



suggested that the data is negatively skewed (did not follow the normal distribution), the kurtosis coefficient (9.5981) also implies that the data is not normally distributed. Similarly, Table 1 indicates that the average growth opportunity (GRWOP) in the listed diversified firms in Nigeria is 0.0167 with standard deviation of 0.3474, and minimum value of -1.0901 and 0.6288 as the maximum growth during the period. This suggests that the average growth opportunity of listed diversified firms in Nigeria during the period of the study is 1.67% and the deviation from the mean 34.74%, while the minimum and maximum growths are -109% and 62.88% respectively. The value of skewness -1.4403 suggested that the data is negatively skewed (did not follow the normal distribution), and the kurtosis coefficient (5.4264) also implies that the data is not normally distributed. Lastly, Table 4.1 shows that the firm size (logarithm of total assets) has an average of 16.688, with standard deviation of 1.2582 and minimum and maximum values of 14.3325 and 18.9572 respectively. The coefficients of skewness (0.2475) and kurtosis (2.0791) imply that the variable did not follow the normal distribution. In view of this, the study applied Shapiro-wilk to test the normal distribution of the data.

Table 2: Normal Data Test

Variables	W	V	Z	P-Values	N
DVPOR	0.9134	4.707	3.339	0.0004	60
MGRSH	0.6428	19.414	6.393	0.0000	60
PERF	0.5724	23.244	6.781	0.0000	60
GRWOP	0.8639	7.401	4.314	0.0000	60
FSIZE	0.9405	3.235	2.530	0.0057	60

*Source: Authors Computation*

To statistically ascertain whether the data for the variables of the study follows the normal distribution assumption, the study used Shapiro-Wilk (W) test for normal data, under this method, null hypothesis principle is used to check a variable that came from a normally distributed population. The null hypothesis of the test is that the “data is normally distributed”. Table.2 indicates that data from all the variables of the study are not normally distributed; because the test show that they are statistically significant at 1% level of significance. Therefore, the null hypothesis (that, the data is normally distributed) is rejected. This suggests a likely high heterogeneity in the panel. Therefore, the inferential statistics of the data collected from which the hypotheses of the study are tested are presented and interpreted in the next sections.

*Correlation Results*

Table 3 presents the Pearson correlation coefficients of the variables of ownership structure managerial shareholding, together with the control variables) and dividend policy (dividend payout ratio) of the listed diversified conglomerates in Nigeria.

Table 3: Correlation Matrix

Variables	DVPOR	MGRSSH	PERF	GRWOP	FSIZE
DVPOR	1.0000				
MGRSH	0.5146 (0.000)	1.0000			
PERF	0.0888 (0.499)	0.0415 (0.7532)	1.0000		
GRWOP	0.1060 (0.420)	-0.0414 (0.7533)	0.2046 (0.116)	1.0000	
FSIZE	0.0946 (0.472)	0.2126 (0.1029)	-0.3018 (0.0191)	0.0122 (0.926)	1.0000

*P-Values in Parentheses*

*Source: Authors Computation*

The correlation result also indicates a significant statistical positive relationship between dividend policy (DVPOR) and managerial shareholding (MGRSH) from the correlation coefficient of 0.5146 which is statistically significant at all 1% level of significance (from the p-value of 0.0000). This result implies that as equity ownership by the management increases, increasing dividend policy is used by the listed diversified firms.

Moreover, Table 3 indicates a positive association between dividend policy (DVPOR) and firm performance (PERF) from the correlation coefficient of 0.0888 which is not statistically significant (from the p-value of 0.4998). This result implies a direct relationship between dividend policy and firm performance during the period, although not statistically significant. The table also indicates a positive relationship between dividend policy (DVPOR) and growth opportunities (GRWOP) from the correlation coefficient of 0.1060 which is not statistically significant (from the p-value of 0.4204). This result implies that as growth opportunities increases, dividend policy used by listed diversified firms increases. Lastly, Table 3 indicates a positive association between dividend policy (DVPOR) and firm size (FSIZE) from the correlation coefficient of 0.0946 which is not statistically significant (from the p-value of 0.4720). This suggests that size of the firm is not significantly related to dividend policy of diversified firms in Nigeria.

*Regression Results and Hypotheses Testing*

This section covers the analysis of the regression results of the model of the study and the test of the research hypotheses. Table 4.4 presents the results for the analysis;

The results in Table 4 show the presence of Heteroskedasticity in the panel as indicated by the Breuch Pagan/Cook-Weisberg test for heteroskedasticity (Hetttest) Chi2 of 17.11 with p-value of 0.0000. This implied the rejection of the null hypothesis of constant variance in the residuals (Homoskedastic). However, the problem has been addressed as the test suggested a more generalized regression model (SUEST). The table on the other hand, indicated the absence of the perfect multicollinearity among the explanatory variables, as shown by the mean VIF of 1.23. The decision criterion for the Variance Inflation Factor is that a value of 10

and above implies the presence of perfect multicollinearity. The Hausman specification tests of the panel regressions conducted suggested Seemingly Unrelated Regression, because the data did not meet the symmetrical assumption, making it difficult for the Hausman to decide on whether to use Fixed or Random Effect regression model for the study.

Table 4: Regression Coefficients

Variables	Coefficients	t-values	P-Values
MGRSH	0.6753	4.14	0.000
PERF	0.0306	0.88	0.378
GRWOP	0.0047	0.61	0.545
FSIZE	-0.0005	-0.21	0.836
CONSTANT	0.0153	0.39	0.698
HETTEST (Chi2)	17.11		0.0000
MEAN VIF	1.23		
HAUSMAN (Chi2)	Suest		
R SQUARE	0.6743		
F-STAT (Chi2)	124.20		0.0000

Source: Authors Computation

Therefore, the results from the model indicate that the independent variables (institutional shareholding, managerial shareholding, foreign shareholding and block shareholding, together with the control variables) explained 67.43% of the total variations in the dividend policy (DVPOR) of listed diversified conglomerates in Nigeria, from the coefficient of multiple determinations ( $R^2$  value of 0.6743). The table also shows that the model is fit at 99% confidence level as evident by the F-Statistic (Chi2) of 124.20 which is statistically significant at 1% level of significance (as indicated by the P-value of 0.0000). Following the fitness of the model, the test of hypotheses formulated in this study is conducted in the following section.

#### *Hypotheses Testing*

The table also shows that managerial shareholding (MGRSH) has a significant statistical positive impact on the dividend payout (DVPOR) of the listed diversified conglomerates in Nigeria, from the coefficient of 0.6753 with t-value 4.14, which is statistically significant at 1% level of significance (p-value of 0.000). This suggests that, when equity ownership by the management increases by 1%, dividend payout increase by 0.68k and, this implies an increasing dividend payout. Based on this, the study rejects the null hypothesis two ( $H_{02}$ ) which states that, managerial shareholding has no significant impact on the dividend payout of listed diversified conglomerates in Nigeria. The study therefore infers that managerial shareholding is a significant determinant of dividend payout of listed diversified conglomerates in Nigeria.

Lastly, the results from Table 4 show that, firm performance (PERF) has a positive impact on the dividend payout (DVPOR) of the listed diversified conglomerates in Nigeria, from the coefficient of 0.0306 with t-value 0.88, which is not statistically significant (p-value of 0.378). This suggests that, performance has not significantly

influenced dividend payout during the period. Similarly, table 4.4 show that, growth opportunity (GRWOP) has a positive impact on the dividend payout (DVPOR) of the listed diversified conglomerates in Nigeria, from the coefficient of 0.0047 with t-value 0.61, which is not statistically significant (p-value of 0.545). This suggests that, growth opportunities have not significantly influenced dividend payout during the period. On the other hand, Table 4 show that, firm size (FSIZE) has a negative impact on the dividend payout (DVPOR) of the listed diversified conglomerates in Nigeria, from the coefficient of -0.0005 with t-value -0.21, which is not statistically significant (p-value of 0.836). This suggests that, size of the firm has not significantly influenced dividend payout during the period

In the course of this research, the analysis conducted revealed that the average dividend payout (dividend payout ratio) of the listed diversified conglomerates in Nigeria is 26.37%, implying a 73.63% retention policy. The findings on the other hand revealed that the ownership structure variables examined (managerial shareholding together with the control variables) accounted for 67.43% of the total variations in the dividend payout of listed diversified conglomerates in Nigeria. Specifically, the study found a significant positive relationship between dividend payout and institutional ownership during the period under review. This finding is consistent with Han et al (1999), Moh'd et al (1995), Manos (2002), but contradicts the findings of Kouki and Guizani (2009), Harjito (2009), D'Sauza and Saxene (1999). The study also found a significant positive relationship between dividend payout and managerial ownership during the period under review. This is consistent with the findings of Moh'd et al (1995) and contradict the findings of Rozeff (1982), Manos (2002), Short et al (2002).

### **5. Conclusion and Recommendation**

Secondary data of 6 firms for a period of 10 years (2005-2014) was employed. Panel regression technique of data analysis was adopted and the study found that the average dividend policy (dividend payout ratio) of the listed diversified conglomerates in Nigeria is 26.37%, implying a 73.63% retention policy. The findings on the other hand revealed that the ownership structure variables examined (managerial shareholding together with the control variables) accounted for 67.43% of the total variations in the dividend policy of listed diversified conglomerates in Nigeria. Specifically, the study found that managerial ownership has significant positive impact on dividend payout during the period under review.

Based on the data collected, and analyzed together with the hypotheses tests, the study concludes that ownership structure has significant positive impact on the dividend payout of the listed diversified conglomerates in Nigeria during the period of the study. Managerial shareholding has a significant statistical positive impact on the dividend policy of listed diversified conglomerates in Nigeria.

Although the results and findings from this study are reliable and robust, the study has some limitations. Due to the peculiarity of the business of diversified conglomerates, the findings of this research may not be applicable to other sectors of the economy. That is, the findings are limited to all diversified companies and their like. The study is also concentrated on the quantitative research methodology,

while complementing with qualitative evidence, would have improved the work. Moreover, there are other components of ownership that are not covered in this work (like the concentration of ownership and state ownership). Similarly, another proxy of dividend policy (dividend yield) is not used by this study.

The study also recommends that, regulators should increase the level of ownership by management as this may reduce the conflict of interest between the owners and the managers. Future empirical studies in this area should examine dividend policy in relation to block shareholding in Nigeria. Future empirical works on this topic should focus on other sectors of the economy using both quantitative and qualitative methodology. Moreover, other components of ownership structure like ownership concentration and state ownership should be examined by future studies.

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## Board Attributes and Financial Performance of Food and Beverage Companies Quoted on the Nigerian Stock Exchange

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### Abstract

*The study examines the impact of board attributes on financial performance of Food and Beverage companies quoted on the Nigerian Stock Exchange. The study examines board attributes namely; Board size, board independence and board gender diversity. The study employs three measures for financial performance; Return on equity, Return on assets and Tobin q. The longitudinal research design was adopted for the study. Secondary data was sourced from the annual reports and accounts of the companies for the period of study which is 2010-2018. Preliminary analysis such as descriptive statistics, correlation and multicollinearity analyses were first conducted. Next, the estimations were initially conducted using the individual performance variables and then we proceeded to a more robust estimation aggregating the individual variables into a performance index using the Principal Component Analysis (PCA). The findings revealed that board size, Board independence, Board gender diversity have statistically significant effects on corporate financial performance. The study recommends that corporate governance is a very germane aspect that companies must focus on if they expect to see improvements in performance.*

**Keywords:** Board size, Board independence, Board gender diversity, financial performance

**JEL Classification:** M00, M14, M20

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### 1. Introduction

The success of business is the focus and main duty of the management of organisations. Ensuring favourable financial performance stands out as an important goal for management and shareholders alike. All activities of most companies are more often than not geared towards how financial performance can be sustained and even improved. Management is continually on the edge as the exit doors of corporations stir them on the face when shareholders become intolerant of dismal financial performance. Corporate board structure has been identified as a critical factor that can affect the financial performance of companies (Ali, Salleh & Hassan, 2008; Skare & Hasic, 2016) and this is because the opportunistic tendency

of managers to engage in unethical practice is reduced in the presence of effective corporate boards. They ensure corporate conformance with investors and society's interests and expectations by limiting the abuse of power, the siphoning-off of assets, the moral hazard, and the wastage of corporate-controlled resources and several other variants of the agency problem. Simultaneously, they establish the means to monitor manager's behaviour to ensure corporate accountability.

A robust set of theoretical paradigms exist in the literature that places in perspective the procedures through which corporate boards are expected to impact on corporate financial performance. For example, the resource based-view theory is of the perspective that corporate boards provide the firm with a robust pool of knowledgeable individuals whose contributions can also provide substantial leverage and competitive advantage for the firm. The agency theory argues that corporate boards lead to effective monitoring of managers and reduces opportunistic behaviour. The agency conflict between managers and shareholders is reduced and this results in improved performance for the firm. In recent times, corporate governance has evolved as an intensely critical issue for organisations especially because of financial crisis.

Though corporate boards are increasingly being viewed as a valued feature of a well-run company and there is a growing literature linking corporate governance to company performance, there is, equally, a growing diversity of results (Korac-Kakabadse, Kakabadse & Kouzmin, 2001). Ammann, Oesch and Schmid (2011) findings showed that better corporate boards practice, significantly reflects on higher market values. This is further supported by Balasubramanian, Black and Khanna (2010), Bauer, Frijns, Otten, and Tourani-Rad (2008) and Tseng, Wu and Lin (2013). In contrast, some studies identify either negative or no correlations between corporate board attributes and company performance. Erkens, Hung, and Matos (2010) established that large board size influences a firm's financial performance negatively. Adusei (2011) found that as the size of the board decreases, its profitability increases. Ajala, Amuda and Arulogun (2012) revealed a negative relationship between board size and banks' financial performance. Shahzad Bajwa, Siddiqi, Ahmid, Raza and Sultani (2016) concluded from their study that board independence had no effect on financial performance. Considering the US context, in tandem with our findings, Choi, Shaker, Yoshikawa, and Han (2014) found no statistically significant relationship between gender diversity and firm performance while Francis, Hasan & Wu (2015) showed a negative relationship between the percentage of female board members and organizational performance. This inconclusive nature of the empirical evidence opens up the area for continuous and further research evaluation. The focus of this study is to examine the effect of corporate boards on financial performance of quoted consumer goods companies in Nigeria.

## **2. Literature Review**

### *Board Size and Corporate Financial Performance*

The agency model suggests that as board size becomes large, the agency problem related to director free riding increases and the board becomes more symbolic and

less a part of the management process (TUC, 2016). Empirically, the evidence regarding the relationship between board size and firm performance is mixed. Anderson *et al.* (2004) found a negative relationship between the board size and the firm value. They outlined that financial markets react positively to the announcement of a board downsizing. Conversely, the announcement of increasing the number of directors in the board leads to reducing the equity value. They stated that this is not the general outline that can be applied to all companies, as it is not a linear reaction. They concluded that the companies who were affected negatively were small- and medium-sized companies, while large companies did not suffer from the same problem. Small boards have been found to be more productive than large ones, evidence showed decrease in efficiency when board size increases, which is attributed to barriers in coordination and processes (Bjatt & Bhattacharya, 2015, *Tomorrow's Company*, 2017).

Sheikh *et al.* (2012) found that when the board size increases the market responds favourably. In their study they report that large boards provide better monitoring for companies with poor operating performance due to their diversity of backgrounds and communication skills. Sanda, Mukaila & Garba (2005) studying a sample of 93 Nigerian listed firms during the period 1996 to 1999, found a positive correlation between the board size and the firm profitability as measured by return on equity (ROE). Their results support that large boards have better access than smaller ones to the external environment by offering better chances to have wide resource for finance and raw materials. This is in line with resource dependence theory that large boards offer greater access to their firm external environment, which facilitate and secure critical resources (e.g. raw materials and finance) and reduces uncertainties (Babatunde & Akeju, 2016)

Skare and Hasic (2016) found a positive relationship between the board size and the firm performance as measured by ROA, which is in contrast with their prior finding of a negative relationship between board size and the firm performance measured by Tobin's Q. The later result is consistent with Haniffa and Hudaib (2006), Beiner *et al.*, (2006) and Coles *et al.*, (2008). This divergence takes place because of the perceptions of the investors and the management for the large boards which are based on large boards enhancing the knowledge of the business. Ho and Williams (2003); Mangena and Chamisa (2008) and Stout (2016) reported that there is no relationship between the board size and firm performance. As can be seen above from the mixed results, there is no consensus as to whether larger or smaller boards are better in influencing firm financial performance.

#### *Board Independence and Corporate financial Performance*

Directors can be classified either as executive (i.e. personnel simultaneously assuming the roles of managers and directors) or non-executive directors, and each category is characterised by different incentives and behaviours (Francis *et al.*, 2015). A combination of both is advised by most national and international corporate governance codes (e.g. the Combined Code in the UK, the OECD Code and the Sarbanes-Oxley Act in the US). Agency theory affirms that sufficient monitoring mechanisms are necessary to protect shareholders from the self-interest of management, and the optimum regulators for this are independent directors. It is

therefore expected that a higher proportion of independent directors in a board indicate improved monitoring and consequently reduced agency problems (Francis et al, 2015). Linck, Netter and Yang (2008) argued that independent directors were intrinsically beneficial to boards due to their experience and firm-specific information; conversely, independent directors provide independent monitoring and improve firm performance. The emergent consensus at least theoretically, is that a diverse, vigilant and strong board of directors exerts a positive influence on firm value, particularly due to improved strategic decision-making and innovation (Tomorrow's Company, 2017).

Although agency theory suggests that independent director's representation improves firm performance, while empirical evidence shows mixed results (Haniffa & Hudaib, 2006; Baranchuk & Dybvig, 2009; Gordini, 2012). Gordini (2012) examined the effect of outsiders on firm performance measured by Return of assets and Return on investment for a sample of 950 Italian small family firms (SFFs) from 2007 to 2009. Gordini reported a positive relationship between them and reports that the independent directors improved firm performance and added value to the firm through their contributions such as skills, experiences and their linkage to the external resources. Khan and Awan (2012) found a positive significant relationship between the outside directors and the firm performance measured by ROA, ROE and Tobin's Q. They conclude that the greater the percentage of outsiders in the board will result in better firm performance and add value to the firm. Conversely, Kumar and Singh, (2012) provided evidence of a negative relationship between the independent directors and some performance measures. The third stream of this relationship provides evidence for no relationship between independent directors and firm performance (Kumar & Singh, 2012). Shahzad et al, (2016) concluded from their study that board independence based on stronger board diversity improvement had no effect on bank performance.

#### *Board Gender Diversity and Corporate financial Performance*

Board diversity is the mixture of men and women on the board (Wagana, & Nzulwa, 2016). Currently board diversity is a highly debatable corporate governance topic. The topic put more emphasis on, gender diversity, i.e. the inclusion of women on corporate boards of directors, considered as an instrument to improve board variety and thus discussions (Staikouras & Agoraki 2007). This is calculated as the total number of women in the board over the board size in a given period. It is believed that board diversity either directly or indirectly affects corporate governance on the firm. Though board diversity might be a constraint, it goes without doubt that for boards to be effective there is need for diverse perspective (Ogbechie & Koufopoulos, 2009, Sofian, Mustafar, Yusoff, & Heng, 2014). As reported by Dutta and Bose, (2007) the presence of women on boards of directors is limited, even if the literature reveals a slow but steady rise in the female presence on corporate boards throughout the world. With reference to the relationship between gender diversity and organisational performance, the few existing empirical studies show contrasting results (Chen, 2013).

Considering the US context, Choi, Shaker, Yoshikawa, and Han (2014) found no statistically significant relationship between gender diversity and firm performance.

Dutta and Bose, (2007) and Chen, Bu, Wu and Liang (2014) reported a statistically significant positive relationship between both the presence and the percentage of women on the board of directors and market value added (MVA) and firm value. Hasan and Wu (2015) showed a negative relationship between the percentage of female board members and organisational performance. Pathan and Faff (2013) opined that board gender is considered as an improvement to the organizational value and performance as it provides new insights and perspectives (Khodakarami, & Zukarnain, 2015). Campbell and Minguez-Vera (2008) examined the relationship between gender and firm value in Spain. They employed panel data for the empirical analysis. The empirical that gender has a positive effect on firm value and that the opposite causal relationship is not significant. In addition, Skare and Hasic (2016) conducted a study on board gender and firm performance. They found out that women on board of directors have significant positive impact on firm performance. This means that increase in the number of female in the board of directors will significantly lead to increase firm performance. This null hypothesis is thus specified below;

#### *Theoretical Framework*

Resource dependence theory emphasises and favours boards of directors due to the wider expertise and knowledge they can provide, as well as improve networking with the external environment. Haniffa and Hudaib (2006) asserted that the fact that Directors can assist to gain access to political and business contacts, capital and information by enhancing networking with external stakeholders, including customers, governments and other companies (e.g. creditors, suppliers and buyers) enables cheaper access to inputs and thus positively affect organisation performance. Pfeffer (1973) and Pfeffer and Salancik (1978) argued that the diversity of the board size and the background of the outside directors were very important elements in managing the company's future capital needs or to manage environment contingency. Pearce and Zahra (1992) also assert that diversifying the board will help the company to survive by benefiting from the exchange of company resources and its external environment. In addition, they report that the presence of the outside directors will result in improving the organization efficient strategies by providing the organisation with new viewpoints and perspectives, which will ultimately improve the financial performance. Carpenter and Westphal (2001) pointed out that organisations' links help them secure their business interests in the event of environmental uncertainty. Furthermore, the resource dependence theory uses the external linkages of the board in order to add value to the organisation and improve the organisation performance. In conclusion, resource dependence theory holds that the operational environment of the organisation is reflected in its board structure which entails that directors are selected according to their ability to facilitate access to required resources.

### **3. Methodology**

This study utilized the longitudinal research design. A sample of 21 quoted companies under the consumer goods sector/industry in the Nigerian stock exchange classification was used for the study. So also, secondary data, by way of annual reports and accounts of the sampled companies in Nigeria and some relevant

NSE fact books were used to collect data for 2010 -2018. The effect of board structure on financial performance was analyzed using panel regression. The pooled OLS, random effects (RE) and fixed effects (FE) were estimated. The Hausman tests for both random and fixed models were conducted. Before the regression analysis, we conducted some diagnostic tests to address some essential assumptions that were fundamental to regression analysis such as Normality, Multicollinearity, Heteroskedasticity Breusch–Pagan test, serial correlation and Ramsey reset test for model specification

*Model Specification*

The model for the study examines board attributes and corporate financial performance. The model builds on the works of Campbell and Minguez-Vera (2008) and Skare and Hasic (2016). The model is specified below;

$$\begin{aligned}
 ROE_{it} &= \partial_0 + \partial_1 BDIND_{it} + \partial_2 BDS_{it} + \partial_3 BDGD_{it} + \partial_4 LEV_{it} + \partial_5 FSIZE_{it} + \varepsilon_{it} + \mu_{it} \dots\dots 1 \\
 ROA_{it} &= \partial_0 + \partial_1 BDIND_{it} + \partial_2 BDS_{it} + \partial_3 BDGD_{it} + \partial_4 LEV_{it} + \partial_5 FSIZE_{it} + \varepsilon_{it} + \mu_{it} \dots\dots 2 \\
 TOBIN-Q_{it} &= \partial_0 + \partial_1 BDIND_{it} + \partial_2 BDS_{it} + \partial_3 BDGD_{it} + \partial_4 LEV_{it} + \partial_5 FSIZE_{it} + \varepsilon_{it} + \mu_{it} \dots\dots 3
 \end{aligned}$$

Where: *ROE*= Return on equity, *ROA*= Return on assets, *TOBIN-Q*= Tobin Q measure of firm value, *BS*=Board size, *BIND*= Board independence, *BDGD*= Board gender diversity, *LEV*= Leverage, *FSIZE*= Firm size, *i* =ith firm, *t* = time period,  $\mu_{it}$  = Model disturbance term,  $\varepsilon_t$  = Stochastic term, *i* = number of sampled cross-sectional firms, *t* = time period of the sampled companies.

The apriori signs are  $\partial_1 < 0$ ,  $\partial_2 < 0$ ,  $\partial_3 < 0$ ,  $\partial_4 < 0$ ,  $\partial_5 < 0$ ,  $\partial_6 < 0$ ,

Table 1: Variable Definition and Measurement

Variable	Definition	Measurement	Source	Aprori sign
ROE	Return on equity	Profit after tax/ total equity	Enobakhare, (2010).	
ROA	Return on assets	Profit after tax/ total assets	Ahmad & Jusoh, (2014)	
TOBIN Q	Tobin Q	Ratio between the market value of the firm's assets and the replacement value of those assets	Adeyemi and Fagbemi, (2010)	
BDIND	Board Independence	Ratio of pnon-executive directors on the board	Bhatta and Bhattacharya (2015)	+
BDGD	Board gender diversity	Board Female-male ratio.	Ogbechie & Koufopoulos, (2009)	+
BDSIZE	Board size	Number of individuals on the board.	Ogbechie & Koufopoulos, (2009)	+
LEV	Leverage	Debt-equity ratio	Sanda, etal (2005)	
FSIZE	Firm size	Log of total assets	Chen, (2013)	

Source: Researcher's compilation (2019)

#### 4. Result

Table 2: Descriptive statistics

	Mean	Median	Maximum	Minimum	Std. Dev.	Jarque-Bera	Probability
BDSIZE	9.7291	10	17	4	2.5963	6.4897	0.0389
BDIND	0.4119	0.6331	0.75	0.11	1.4159	4958.52	0.000
BDGD	0.2961	0.08	0.40	0.00	0.8025	3904.59	0.00
ROA	0.8438	0.2981	11.0205	-5.0129	1.7048	2949.233	0.00
ROE	1.2631	0.2558	36.4726	-0.3803	51.0143	216.0307	0.000
TOBINQ	2.4181	1.5076	91.5093	-77.874	58.2001	140795.2	0.00
FSIZE	6.9248	6.9332	8.9760	5.31917	1.2237	7011.874	0.00
LEV	0.2692	0.2280	1.5401	0.068594	0.2103	1021.952	0.00

*Source: Researcher's compilation (2019)*

The descriptive statistics of the data is presented in Table 2 above. As observed, board size had an average value of approximately 10 which implies that, the average board size for the sample is 10 members. There is still a lot of controversy in management literature regarding the appropriate number of individuals that should make up an ideal board size. The maximum and minimum values stood at 17 and 4 respectively and the dispersion of the data about the mean is at 2.596 The Jacque-bera value of 6.48978 and p-value of 0.00 confirms the normality of the data. BDIND has an average value of 0.41 which indicates that about 41% of board members are independent members with maximum and minimum values of 75% and 11% respectively and the standard deviation of 1.4159 suggest considerable clustering around the distribution mean. The Jacque-bera value of 4958.732 and p-value of 0.00 confirms the normality of the data. The Board gender diversity is 0.296 which suggest that on the average about 29.6% of board members are females. The maximum and minimum values are 40% and 0 respectively. The Jacque-bera value of 3904.59 and p-value of 0.00 confirms the normality of the data.

ROA has a mean of 0.843 with maximum and minimum values of 11.020 and minimum of -5.01 respectively. The standard deviation is 1.7048 which imply the dispersion of ROA from the distribution mean. ROE has a mean of 1.3 with maximum and minimum values of 36.47 and minimum of -0.3803 respectively. The standard deviation stood at 51.0143 which is an indication of the extent of dispersion of ROE from the distribution mean. Tobin q has a mean of 2.418 with maximum and minimum values of 91.509 and minimum of -77.874 respectively with a standard deviation at 58.200. The average LEV Ratio is about 0.30 with a maximum value of 1.44 and minimum value of 0.069 respectively. The standard deviation showing the dispersion of the data about the mean is quite low at 0.2094. The mean value for firm size measured as log of total assets stood at 6.9248 with maximum and minimum values of 8.976 and 5.31917 respectively with a standard deviation of 1.223. The Jacque-bera value of 7011.874 and p-value of 0.00 confirms the normality of the data. The average LEV Ratio is about 0.269 with a maximum value of 1.54 and minimum value of 0.069 respectively. The standard deviation showing the dispersion of the data about the mean is quite low at 0.210369. The Jacque-bera value of 1021.952 and p-value of 0.00 confirms the normality of the data.

From Table 3, the correlation coefficients of the variables are examined. However of particular interest to the study is the correlation between corporate financial performance measures (ROE, ROE and Tobin Q) and the independent variables. As observed, BDSIZE is positively correlated with ROA ( $r=0.026$ ) though not significant at 1 or 5%, negatively correlated with ROE ( $r=-0.008$ ) though not significant either at 1% or 5% and positively correlated with Tobin Q ( $r=0.046$ ) which is also not significant at 1 or 5%. As observed, BIND is negatively correlated with ROA ( $r=-0.083$ ) and Tobin Q ( $r=-0.009$ ) but positively correlated with ROE ( $r=0.005$ ) though none of the estimates were significant either at 1% or 5% level and hence no significant association was detected. BDGD is negatively correlated with ROA ( $r=-0.137$ ) and Tobin Q ( $r=-0.007$ ) and positively correlated with ROE ( $r=0.007$ ) though none of the estimates were significant either at 1% or 5% level and hence no significant association was detected.

Table 3: Pearson Correlation Matrix

	BDSIZE	BDIND	BDGD	ROA	ROE	TOBINQ	FSIZE	LEV
BDSIZE	1							
BDIND	.302**	1						
	Sig.	0						
BDGD	.294**	.771**	1					
	Sig.	0	0					
ROA	0.026	-0.083	-.137*	1				
	Sig.	0.61	0.103	0.007				
ROE	-0.008	0.005	0.007	.202*	1			
	Sig.	0.87	0.917	0.885	0			
TOBIN Q	0.046	-0.009	-0.007	-	-	1		
	Sig.	0.365	0.853	0.884	0.005	0.027		
FSIZE	.160**	0.068	0.021	-	.291*	0	1	
	Sig.	0.002	0.182	0.683	0.092	*		
LEV	-0.009	-.101*	-.102*	-0.04	0.07	0	0.993	1
	Sig.	0.86	0.045	0.043	0.426	0.596	0.617	0.001

Note: \* Correlation is significant at the 0.05 level (2-tailed); \*\* Correlation is significant at the 0.01 level (2-tailed).

Source: Athours' Computation (2019)

Table 4: Variance Inflation Factor Test

Variable	ROE	ROA	TOBINQ
BFSIZE	1.708008	1.9151	1.698156
BDIND	1.292583	4.910936	1.285217
BDGD	1.133199	4.615146	1.129367
FSIZE	1.619738	1.610688	1.614340
LEV	1.129346	1.041354	1.133105

Source: Athours' Computation (2019)

The variance inflation factor (VIF) explains how much of the variance of a coefficient estimate of a regressor has been inflated, as a result of collinearity with the other regressors. Essentially, VIFs above 10 are seen as a cause of concern as



observed, none of the variables have VIF's values more than 10 and hence none gave serious indication of multicollinearity.

Table 5 show the regression results of the fixed effects (FE) model as the preferred estimation technique based on the Hausman test statistic. Column 3 shows the estimation results for the relationship between corporate governance and ROE measure of financial performance. The hausman statistics of 0.006 justifies the presentation of fixed effects estimation result. As shown in the results, the  $R^2$  for the model is 0.1752 which implies that the model explains about 17.52% of the systematic variations in the dependent variable with an adjusted value of 12%. The F-stat is 3.18808 (p-value = 0.00) is significant at 5% and suggest that the hypothesis of a significant linear relationship between the dependent and independent variables cannot be rejected. The analysis of coefficients reveals BDS is positive (0.19592) and significant (p=0.0322) at 5%. The positive coefficient suggests that increase in board size will result in an increase in corporate financial performance. BIND has a negative beta (-1.25186) and also significant (p=0.0149) at 5%. BDGD had a positive beta (0.226307) though not significant (p=0.3498) at 5%. A look at the control variables reveals that the coefficient of firm size is positive (0.2715) and significant at 5% while that of leverage is negative (-0.95964) and significant at 10%.

Column 4 shows the estimation results for the relationship between corporate governance and ROA measure of financial performance. The hausman statistics of 0.00 justifies the presentation of fixed effects estimation result. As shown in the results, the  $R^2$  for the model is 0.5246 which implies that the model explains about 52.46% of the systematic variations in the dependent variable with an adjusted  $R^2$  of 43.5%. The F-stat is 16.50849 (p-value = 0.00) which is significant at 5%. The analysis of coefficients reveals BDS is positive (0.0035) though not significant (p=0.4688) at 5%. BIND has a positive beta (0.01539) and though not significant (p=0.1025) at 5%. BDGD had a negative beta (-0.01767) and not also significant (p=0.344) at 5%. A look at the control variables reveals that the coefficient of firm size and leverage is positive though not significant at 5%.

The robust estimation using the financial performance index is used for the results discussion and test of hypothesis. The analysis of coefficients reveals BDS as negative (-0.01078) though not significant (p=0.4240) at 5%. The result implies that increasing the board size will lead to a decline in financial performance. Hence we accept the null hypothesis that board size has no significant effect on corporate financial performance. As observed earlier, in the literature, there is still no consensus regarding what constitutes an appropriate or optimal board size. The findings of the study are in tandem with Kholief (2009) Ahmed, Hossain and Adams (2006) but is in contrast with the views of Bhatt and Bhattacharya, (2015), Francis, Hassan and Wu (2015), Tomorrow's Company (2017).

Column 5 shows the estimation results for the relationship between corporate governance and Tobin q measure of financial performance. As shown in the results, the  $R^2$  for the model is 0.2440 which implies that the model explains about 24.0% of the systematic variations in the dependent variable with an adjusted  $R^2$  of

19.36%. The F-stat is 4.842 (p-value=0.00) is significant at 5%. The analysis of coefficients reveals BDS is positive (0.0662) though not significant (p=0.1594) at 5%. BIND had a negative beta (-0.40459) and significant (p=0.0311) at 5%.

Table 5: Regression Result

Variable	Aprori sign	ROE	ROA	TOBINQ	Financial performance index
C		-4.0715* (1.130) {0.0004}	0.74205* (0.1254) {0.000}	0.8849 (1.111) {0.4263}	-0.14823 (0.4103) {0.7183}
BBSIZE	+	0.19592* (0.0911) {0.0322}	0.0035 (0.0048) {0.4688}	0.0662 (0.047) {0.1594}	-0.01078 (0.0135) {0.4240}
BDIND	+	-1.2518* (0.5118) {0.0149}	0.01539 (0.0094) {0.1025}	-0.40459* (0.1869) {0.0311}	-0.64375* (0.2059) {0.0020}
BDGD	+	0.226307 (0.24175) {0.3498}	-0.01767 (0.0186) {0.344}	-0.12952 (0.248021) {0.6019}	-1.11447* (0.3725) {0.0031}
FSIZE	+	0.2715* (0.1206) {0.025}	0.001117 (0.0183) {0.025}	0.13461 (0.1158) {0.2459}	0.10632 (0.0669) {0.1137}
LEV	+	-0.95964 (0.5181) {0.0649}	0.07684 (0.0534) {0.1514}	0.103977 (0.462667) {0.8223}	-0.3222 (0.17352) {0.0648}
Model Parameters					
R <sup>2</sup>		0.175284	0.524632	0.244034	0.7029
Adjusted R <sup>2</sup>		0.120303	0.492852	0.193636	0.6382
F-statistic		3.18808	16.50849	4.842166	10.00
Prob(F-stat)		0.000001	0.000	0.000	0.00
D.W		1.7	1.7	1.9	1.8
Model Diagnostics					
Hausman		0.006	0.000	0.011	0.004
serial corr.		0.893	0.546	0.536	0.893
B-G for Hetero.		0.554	0.435	0.592	0.554
Ramsey Reset test		0.410	0.120	0.383	0.467

Note: standard errors in parenthesis; p-values, \* sig at 5%

Source: Athours' Computation (2019)

The result shows that increasing the number of independent directors on the board will not result in an increase in Tobin q value of the firm. BDGD had a negative beta (-0.12952) though not significant (p=0.6019) at 5%. A look at the control variables reveals that both firm size and leverage are positive though not significant at 5%.

BIND had a negative beta (-0.64375) and significant (p=0.0020) at 5%. The result shows that board independence is a significant determinant of financial performance though increasing the number of independent directors on the board will not necessarily result in an increase in financial performance of the firm. Hence we reject the hypothesis that board independence had no significant effect on corporate financial performance. Empirically, the results have been quite mixed

in the literature (Haniffa & Hudaib, 2006; Baranchuk & Dybvig, 2009; Gordini, 2012). Gordini (2012) reported a positive relationship between BIND and firm performance. Conversely, Bozec (2005) provided evidence of a negative relationship between the independent directors and firm financial performance measures and studies like Arosa, Hurralde and Maseda (2012) and Kumar and Singh (2012) provide evidence for no relationship between independent directors and firm performance.

Column 6 results show a robust estimation where the board attributes were regressed against the financial performance index by aggregating the different performance variables to derive a uni-dimensional statistical index of corporate financial performance using principal component analysis (PCA). More recently, studies have applied principal components analysis to such data to derive an index (McKenzie 2003). PCA handles efficiently and statistically the issue of what weights to be assigned to each variables using the eigen-values. As shown in the results, the  $R^2$  is 0.703 which implies that the model explains about 70.3% of the systematic variations in the dependent variable with an adjusted  $R^2$  of 63.8%. The F-stat is 10.00 (p-value = 0.00) and significant at 5%. The analysis of coefficients reveals BDS is negative (-0.01078) though not significant (p=0.4240) at 5%. BIND has a negative beta (-0.64375) and significant (p=0.0020) at 5%. The result shows that increasing the number of independent directors on the board will not necessarily result in an increase in financial performance of the firm. BDGD has a negative beta (-1.11447) and significant (p=0.0031) at 5%. The result implies that a less female presence in the board is better for firm financial performance; a look at the control variables reveals that the coefficient of both FSIZE and LEV do not show any statistical significance at 5% level of significance.

The effect of BDGD is negative (1.11447) and statistically significant (p=0.0031) at 5%. The result implies that a less female presence in the board is better for firm financial performance. Hence we reject the hypothesis that board diversity has no significant effect on corporate financial performance. With reference to the relationship between gender diversity and organisational performance, the few existing empirical studies show contrasting results (Ishak & Manaf, 2013, Chen, 2013, Wagana & Nzulwa, 2016). Considering the US context, in tandem with our findings, Choi, Shaker, Yoshikawa, and Han (2014) found no statistically significant relationship between gender diversity and firm performance. In the same vein, Francis, Hasan and Wu (2015) showed a negative relationship between the percentage of female board members and organisational performance. Adams and Mehran (2012) concluded from their study that board based on stronger board diversity improvement has no effect on firm performance. Eklund, Palmberg and Wiberg (2009) found that a negative relationship exist between female board members and bank performance. However, Dutta and Bose, (2007) and Chen, Bu, Wu and Liang (2014) reported a statistically significant positive relationship between both the presence and the percentage of women on the board of directors and firm value.

## 6. Conclusion and Recommendation

The board structure and attributes have been identified as critical to the firm's financial performance. This is because the opportunistic tendency of managers to engage in unethical practice is reduced in the presence of effective corporate board structure. They ensure corporate conformance with investors and society's interests and expectations by limiting the abuse of power, the siphoning-off of assets, the moral hazard, and the wastage of corporate-controlled resources and several other variants of the agency problem. Consequently, the study examined board attributes and financial performance of food and beverage companies quoted on the Nigerian Stock Exchange. The study employed three measures for financial performance; Return on equity, Return on assets and Tobin q. The analysis of coefficients revealed that the effect of Board size on financial performance is negative and significant at 5%. The effect of Board independence on corporate financial performance is positive and statistically significant at 5%. The effect of Board gender diversity is negative and statistically significant at 5%. Based on the findings, the study recommends that companies must ensure that they maintain a board size that is not large. Although, there is yet no consensus as to what number constitutes a large board, it is the opinion of the researchers that companies maintain not less than eight (8) members this again depends on the size and other peculiarities of the companies. The study also recommends that companies should increase the number of their independent directors and finally companies should find an appropriate gender diversity mix.

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## **Balance of Payments Response to Crude Oil Price Asymmetry in Nigeria: An NARDL Approach**

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### **Abstract**

*This study investigates the Balance of Payments Response to Crude Oil Price Asymmetry in Nigeria from 1981 to 2018 using the Nonlinear Autoregressive Distributed Lag technique. The results from bounds test revealed that there is cointegration between crude oil prices and balance of payments, exchange rate and oil exports. Crude oil prices were decomposed into positive and negative shocks to capture asymmetry. The short run estimates reveal that positive shocks of crude oil price generates a positive response from balance of payments and also the one-period lag of balance of payments impacts positively on current period balance of payments. Meanwhile, in the long run, estimate show that only negative shocks of crude oil prices are statistically significant and they generate a negative response in balance of payments. Furthermore, the error correction coefficient shows that the speed of adjustment towards long run equilibrium is at 59.5 per cent. Therefore, the study concludes that crude oil prices have direct link with the balance of payments and the study recommend that the authorities should encourage local production and discourage importation of consumer goods so as to reduce the weight assigned to crude oil in the balance of payments.*

**Keywords:** Balance of payments, Crude oil prices, Exchange rate, NARDL

**JEL Classification:** C32, F32, P28.

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### **1. Introduction**

Since the discovery of crude oil in Nigeria in 1956 till date, the Nigerian economy has gradually shifted to an oil dependent economy to the detriment of other real sectors. This has made crude oil the base of the economy on which all fiscal activities are planned and budgeting is made. This is evident from the fact that in 2018, crude oil trade constituted about 66% of total trade, its export constituted more than 96% of total exports while non-oil imports constituted 99% of total imports, thereby indicating that Nigeria is basically a consuming economy due to negligence of other sectors of the economy (CBN, 2020). Furthermore, Crude oil balance of trade stood at ₦ 14159.69 billion as compared to non-oil balance of trade of ₦ -8324.76 billion which further buttresses the large oil-export dependence

of the Nigerian economy while it contributes more than 58% of federal government revenue (CBN, 2020).

The overdependence of the economy on crude oil is indicative of the Dutch Disease Syndrome, which is explained as a structural economic imbalance emerging from mismanagement of oil income that brings about negative influence on the economy, thereby leading to lower prices for the nation's non-oil output in the highly competitive international market (Afolabi, 2019). This consequentially leads to uncertainty in fiscal planning expectations as regards to the price of crude oil, on which the economy depends. This price of crude oil is highly unstable and can hardly be influenced by a single country except in cases like Saudi Arabia or the Russian Federation which have a large share of about 12.9% and 12.6% respectively of global production (BP, 2020).

The crude oil-dependent nature of the Nigerian economy has made it difficult to steer the economy properly. This is because of the unstable and highly volatile nature of crude oil prices, during the periods of high crude oil prices, which brings about windfall gains, the government tends to get carried away and end up squandering the revenues on relatively unproductive ventures while in times of crude oil price attenuation, such economies were unable to meet their fiscal obligations and hence, will relent to depleting their reserves and in most cases, venture into borrowing, thereby leaving them with crushing debt servicing problems (Matthew & Adegboye, 2012) as well as balance of payment issues, high levels of inflation as well as unfavourable exchange rate.

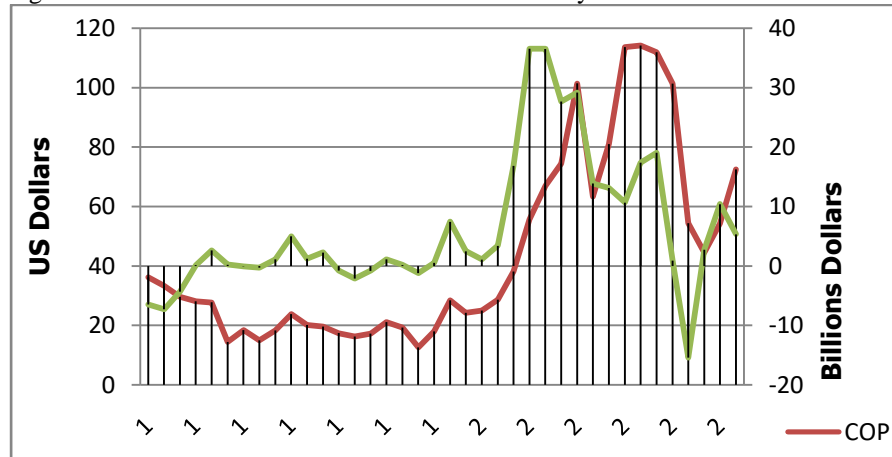
Crude oil prices have been very unstable over time as is evident from its trend in Figure 1. In the early 1980s, there was a steady decline of crude oil price from 36.18 dollars in 1981 down to around 1986 when it dipped to 14.46 dollars per barrel (BP, 2020), this abysmal drop reflected on the balance of payments which has been on a steady incline from -6.47 billion dollars in 1981 to about 2.60 billion dollars in 1986 and then afterwards, it witnessed a decline for about three consecutive years. Prior to 2001 from the 1990s, crude oil price maintained an average of 19.02 dollars per barrel until in 1998 when it suddenly dipped to 12.62 dollars per barrel due to the Asian financial crisis. The early 2000s saw a gradual incline in crude oil prices until it leapt to 101.43 dollars per barrel in 2008. Economic scholars and observers have argued that this leap was as a result of the invasion of Iraq as well as falling Dollar rates (BP, 2020). During this period, oil suppliers such as Nigeria had windfall gains while importers felt the blow of higher prices. In 2009, there was a sudden dip and by 2010, a crude oil price was already recovering with a steep rise and this also reflected on the balance of payments which rose to 19.05 billion dollars in 2013 (WDI, 2020).

Crude oil is arguably the most important global commodity as its uses cut across all spheres from domestic use to industrial use and there is no nation which is not involved in the trade of crude oil in one form or another (crude form, its by-products or its numerous derivatives). Several factors which range from geopolitics, war, economic, social and health crises to demand and supply issues as well as growing environmental concerns and development of cleaner energy



sources among others are the determinantsof crude oil prices in the international market, hence, it is highly volatile and delicate and as well, has a very significant and pronounced impact on the macroeconomic stability of economies, be it an oil exporter or importer (Umoru, Ohiomu&Akpeke, 2018).

Figure 1: Trend of Crude Oil Price and Balance of Payment



Source: Author's computation using Microsoft Excel, 2020.

Crude oil as the major export commodity in Nigeria is tightly associated with the balance of payments in that it is capable of bringing about a deficit (unfavourable) or surplus (favourable) balance of payments. This is because, following the laws of supply, higher crude oil prices will generate higher supply and as such, could improve balance of payments position through the current account, while a very low price could reduce supply and as such, reduce the weight of crude oil export in the trade balance which happens to be the largest and most significant item on the current account in the balance of payment. In addition, with crude oil export being the major driving component of current account balance, it therefore makes crude oil demand/supply, through its price, a major determinant of the Naira exchange rate as it is the major cause for Naira demand from other countries. Hence, a change in crude oil price is always accompanied by an exchange rate disruption (Alhassan & Kilishi, 2016), which has a pass-through effect on balance of payments.

Apart from being a major source of disruption of the external economic balance, crude oil price instability also causes internal disruptions. The nation's budget is prepared using a benchmark oil price, this means that if there is a sustained decline in the price of crude oil, the government will be unable to meet its fiscal obligations and this could lead to rise in level of inflation in the economy due to budget deficit and in most cases, borrowing on the part of the government (Aigheyisi, 2018).

Evidence shows that there were very scanty literature which treats the subject matter of crude oil price and balance of payments. However, there are a lot of studies which investigated crude oil prices; its relationship with exchange rate,

economic growth, inflation or some other macroeconomic variables (see Alhassan & Kilishi, 2016; Oghenebrume, 2018; Hashimova, 2017; Wu & Yu, 2017). Some of the few available literature that actually examined crude oil price and its impact on balance of payment in Nigeria include Sakanko *et al.*, (2019), Afolabi (2019) and Broni-Bediako, Onyije and Unwene (2018). The difference with this study however, is that, while other studies assume that crude oil price is symmetric in its effect, this study will among other things examine the impact of crude oil price asymmetry on balance of payments in Nigeria hence, assuming an asymmetry in crude oil price effects following the position of Hamilton (1983); Adeniyi, Oyinlola and Omisakin(2011); and Shin (2014); that macroeconomic variables have asymmetric responses to crude oil price changes as well as Adeyemi and Hunt (2007) which posits that energy resource prices have a likelihood for asymmetric impact due to the nature of their demand.

The importance of crude oil cannot be overemphasized as it is the lifeline of the Nigerian economy, and with its unstable prices over time, it then becomes germane that its impact on balance of payments be ascertained since balance of payments serves as an important external performance measure or indicator and defines the strong point of a nation's trade position. The rest of this paper is structured as follows: section two is literature review, wherein necessary concepts will be treated and related literature will be examined; section three contains the methodology which deals with the data presentation, model specification, definition and sources of data and as well, states the techniques of analysis; section four presents the result and its interpretation and discussions while in section five, conclusions and policy recommendations will follow.

## **2. Literature Review**

The balance of payment, otherwise called the balance of international payments is a very important macro-economic indicator as it serves as the balance sheet of an economy. Broni-Bediako, Onyije and Unwene (2018) define balance of payment as the documentation of all economic operations between residents of a country and the rest of the world within a given time frame. It recaps an economy's dealings with other countries of the world. CBN (2020) defines balance of payments as a systematic record of economic and financial transactions for a given period between residents and non-residents of an economy. These transactions involve the provision and receipts of real resources and changes in claims, and liabilities on the rest of the world. The fact that no nation is self-sufficient has led to interdependency in the need to exchange goods and services among economies, and this transnational trade among economies is possible only through the buying and selling of a country's currency hence, the need for exchange rate. Exchange rate shows the value of one country's currency in relation to another.

Olanipekun and Ogunsola (2017) posit that exchange rate policy has an extensive array of effects on both external and internal balances. Appreciation of a country's currency by the monetary authorities in an importer-economy may have unfavourable outcome on the real sector, balance of payments and general prices. Therefore, an exchange rate movement in relations to balance of payments has been

a major focus to policy makers since it is believed to have a pass-through effect via exports and imports following the Marshall-Lerner condition.

The Marshall-Lerner condition states that an increase in exchange rates (devaluation) has a positive impact on the balance of payments given. That the country's exports and imports are considered to be price elastic when summed up in absolute terms since currency devaluation makes exports cheaper and imports more expensive thereby encouraging demand for export. The Marshall-Lerner condition is the theoretical base for this study as relates to exchange rate, which is greatly determined by oil prices and oil exports to balance of payments thereby, creating a relationship between the variables. According to the Marshall-Lerner condition, an increase in exchange rate is expected to improve the Nigerian balance of payments position through increase in demand for crude oil export since it is the major export commodity.

There are a few existing studies which have examined the balance of payment and crude oil price nexus. For instance, Sakanko, Obilikwu and David (2019) investigate oil price volatility and balance of payments in Nigeria using data from 1980 to 2017. The Autoregressive Conditional Heteroskedasticity (ARCH) results reveal that the volatility in crude oil price is not mean-reverting; its negative shocks generate more influence than positive shocks. Results from the Autoregressive Distributed Lag (ARDL) model, test the presence of long run relationship between included variables. The results reveal a negative significant relationship between oil price and balance of payment in the long run while oil export has a positive significant impact in the long run. The short run estimates show current period oil price, one-period lag real GDP and one-period lag oil export with a negative coefficient while one-period lag oil price, current period GDP and oil export are found to be positively related to balance of payments. All regressors are significant with a 36.01 per cent adjustment speed.

Afolabi (2019) examines crude oil price fluctuations and balance of payment in Nigeria using data from 1987 to 2017. The bound test result reveals a long run relationship between balance of payment and the explanatory variables. The short run estimates reveal that both oil prices and exchange rate have negative significant impact on balance of payment while in the long run, both oil price and exchange rates have a negative significant effect on balance of payment. Broni-Bediako, Onyije and Unwene (2018) examine the economic effects of oil price in Nigeria using a series of different Ordinary Least Squares (OLS) equations. Using data from 1990 to 2015, they find that crude oil prices had positive impact on exchange rate as well as on balance of payments.

Examining the movement of exchange rates on balance of payment in South Asia, Jayasooriya (2020) used panel data from 1980 to 2015 on all south Asian countries. The dynamic fixed effects regression show both GDP and exchange rate to have positive significant relationship on balance of payments in the long run while in the short run, exchange rate had a negative impact while GDP has a positive impact, although both are statistically significant. David and Elijah (2020) examined the exchange rates and balance of payments nexus in Nigeria using data from 1986 to

2018. Results from pairwise correlation show a weak positive correlation between balance of payment to GDP ratio and exchange rates while ARDL estimates show a positive and significant relationship between exchange rate and balance of payments to GDP ratio in both the long and short run.

Sujianto (2020) investigates the macroeconomic factors responsible for determining balance of payments in Indonesia using annual data from 2010 to 2017. Evidence from cointegration and VECM regression show that in the long run, exchange rates and GDP have significant negative and significant positive impact on balance of payments respectively while in the short run, both variables were insignificant in determining balance of payments. Further evidence from Granger causality shows that there is no causality running between exchange rate and balance of payment as well as GDP too. While Eke, Eke and Obafemi (2015) assess the impact of exchange rate on the balance of trade of Nigeria from 1970 to 2012 using annual time series which were analysed in a cointegration and vector error correction model. The estimates show that exchange rate had a significant negative impact on balance of trade.

Evidence from reviewed literature show that there were mixed opinions on the impact of crude oil prices on balance of payments in Nigeria as some say it has a positive relationship (see Sakanko *et al.*, 2019; Afolabi, 2019) while others report a positive relationship between oil prices and balance of payments (see Broni-Bediako *et al.*, 2018). considering the results obtained from previous studies and the fact that there a only a handful of them, this study investigates the asymmetric impact of oil prices on Nigerian balance of payments in order to determine the real nature of relationship as well as add to the stock of knowledge.

**3. Methodology**

This study adopts the model used by Sakanko *et al.* (2019) with little adjustments aimed at tailoring the model to well suit the objectives of the study. Their empirical analysis was based on a symmetric ARDL model as follows:

$$\Delta BOP_t = \alpha_0 + \alpha_1 \sum_{i=0}^n \Delta BOP_{t-i} + \alpha_2 \sum_{i=0}^n \Delta OILP_{t-i} + \alpha_3 \sum_{i=0}^n \Delta OILEXP_{t-i} + \alpha_4 \sum_{i=0}^n \Delta GDPR_{t-i} + \delta_1 BOP_{t-1} + \delta_2 OILP_{t-1} + \dots + \delta_4 GDPR_{t-1} + \mu_t \dots\dots\dots 1$$

Where: BOP is balance of payments, OILP is crude oil price, OILEXP is crude oil export, GDPR is real GDP,  $\Delta$  is the difference operator which shows the short run estimates, t is time period and  $\mu$  is error term. In this study, we include exchange rates as it has been identified as a major determinant of balance of payments position (Afolabi, 2019) and this study excludes GDP from its analysis as it is not relevant in determining BOP. Furthermore, following Shin, Yu & Greenwood-Nimmo (2014), we decompose crude oil price into its positive and negative changes. This gives the model for this study in its functional form as thus:

$$BOP = f(COP\_POS, COP\_NEG, OXP, EXR) \dots\dots\dots 2$$

Where, BOP is balance of payments, COP\_POS is positive crude oil price shocks, COP\_NEG is negative crude oil price shocks, OXP is crude oil export and EXR is real exchange rates. The sources of data are all of secondary sources, covering the

period from 1981 to 2018. Specifically, data on BOP and OXP were gotten from CBN annual statistical bulletin (2020), data on COP is the Nigerian Forcados annual spot price gotten from BP statistical yearbook (2020), while data on EXR were gotten from World Bank WDI (2020). For the purpose of empirical investigation, equation (2) is restated into its general statistical form as thus:

$$BOP_t = \alpha_0 + \alpha_1 COP\_POS_t + \alpha_2 COP\_NEG_t + \alpha_3 OXP_t + \alpha_4 EXR_t + \mu_t \dots\dots\dots 3$$

Where  $\alpha_0$  is constant or equation intercept,  $\alpha_1 - \alpha_5$  are unknown parameters or slope coefficients and  $\mu_t$  is the stochastic disturbance term. In order to avoid multicollinearity due to difference in scaling as well as extremely large values, COP, OXP and EXR will be transformed into their logarithm form, and BOP having negative values which make log transformation impossible, will be used as a percentage of GDP. The transformation yields the following linear-log model:

$$BOP_t = \alpha_0 + \alpha_1 \log COP\_POS_t + \alpha_2 \log COP\_NEG_t + \alpha_3 \log OXP_t + \alpha_4 \log EXR_t + \mu_t \dots\dots\dots 4$$

The first step is to examine the time series properties of the series using Phillip-Perron stationarity test designed by Philip and Perron (1988). This test is to check for the presence of unit root in the series. It tests the null hypothesis of non-stationarity against its alternative. If the test statistics in absolute terms is greater than the Mckinnon critical value at 5 per cent, then the null hypothesis is rejected. A series is stationary at levels if the null hypothesis is rejected without carrying out any differencing while it is stationary at first difference if the null hypothesis is rejected only after first differencing.

The f-statistics generated from estimating equation (5) will be compared with critical bounds values by Pesaran, Shin and Smith (2001) at 5 per cent significance level. If the f-statistics is greater than the upper bounds value, there is cointegration among the variables; however, if the f-statistics is lesser than the lower bounds value, then there is no cointegration among the variables. In a case where there is cointegration, the levels form and the error correction form of the model will be estimated.

Following the Non-linear Autoregressive Distributed Lag (NARDL) frame work which according to Shin, Yu & Greenwood-Nimmo (2014) is capable of handling asymmetric explanatory variables when a non-linear relationship is suspected to exist between regressors and regressand, the following equation is to be estimated:

$$\begin{aligned} \Delta BOP_t = & \alpha_0 + \alpha_1 \sum_{i=0}^n \Delta BOP_{t-i} + \alpha_2 \sum_{i=0}^n \Delta COP\_POS_{t-i} + \alpha_3 \sum_{i=0}^n \Delta COP\_NEG_{t-i} + \\ & \alpha_4 \sum_{i=0}^n \Delta OXP_{t-i} + \alpha_5 \sum_{i=0}^n \Delta EXR_{t-i} + \delta_1 BOP_{t-1} + \delta_2 COP\_POS_{t-1} + \dots + \\ & \delta_5 EXR_{t-1} + \mu_t \dots\dots\dots 5 \end{aligned}$$

The above equation is the general form of the NARDL model which is a varied form of ARDL. The first part with the difference operator ( $\Delta$ ) captures the short run dynamics while the second part captures the long run. The reason for selecting this method is because of the advantages the ARDL has over other techniques. It is able to combine both long and short run into one single reduced form equation and as

well, can handle the combination of stationary and non-stationary series without generating a spurious result.

#### 4. Results

##### *Descriptive Statistics*

The descriptive statistics presented in Table 1 shows the individual properties of the variables in relation to their distribution. It shows Oil export (OXP) with the highest mean of 6.64 while balance of payments (BOP) has the lowest mean, 2.76 meanwhile crude oil price (COP) and exchange rate (EXR) have means of 3.55 and 3.42 respectively. Given the mean values, BOP appears to be the most varied as it has a standard deviation of 5.67 while COP is the least with a standard deviation of 0.68, OXP and EXR are between the highest and lowest with 2.68 and 1.98 respectively.

The skewness statistic shows EXR and OXP to be negatively skewed while BOP and COP are positively skewed and with all the skewness statistics close to zero, it is concluded that the variables follow a normal distribution while the kurtosis statistics show all variables to be platykurtic as they have positive values. The Jarque-Bera statistics is used to show if the variable follows a normal distribution and from Table 1, the probability values show that only BOP does not follow a normal distribution.

Table 1: Descriptive Statistics

Variable	Mean	Std. Deviation	Skewness	Kurtosis	Jarque-Bera	Jarque-Bera Prob.
BOP	2.7585	5.6730	1.1221	4.4933	11.5053	0.0031
COP	3.5461	0.6757	0.4155	1.8640	3.1368	0.2083
EXR	3.4175	1.9764	-0.7633	2.2703	4.5331	0.1036
OXP	6.6443	2.6772	-0.5343	1.8459	3.9170	0.1410

*Source: Author's computation using e-views 10, 2020.*

##### *Stationarity Test*

The unit root test is conducted using Phillips-Perron test which was chosen over Augmented Dickey-Fuller test because of its ability to correct for serial correlation in the series. In Table 2, it is seen that all variables have their critical values in absolute terms greater than their PP statistics, thereby denoting the acceptance of the null hypothesis of non-stationarity at levels, while, at first difference, all PP statistics are greater than the corresponding critical values. This therefore, implies that all variables are stationary at first difference and as such, are integrated at order I(1). Following the provisions by Pesaran *et al.* (2001), a combination of first differenced stationary variables can be cointegrated. Hence, it becomes necessary that we test for long run relationship using bounds test.

Table 2: Phillips-Perron Test for Stationarity

Variables	Levels		First Difference		Remarks
	PP Statistics	5% Critical Value	PP Statistics	5% Critical Value	
BOP	-2.552524	-2.943427	-7.882306	-2.945842	I(1)
COP	-0.947678	-2.943427	-5.616624	-2.945842	I(1)
OXP	-1.194384	-2.943427	-6.327996	-2.945842	I(1)
EXR	-2.121944	-2.943427	-5.170057	-2.945842	I(1)

*Source: Author's computation using e-views 10, 2020.*

*Bounds Test for Cointegration*

The bounds test for cointegration is a test used in assessing the presence of cointegration among series. From table 3, it can be seen that the F-statistics at 4 degree of freedom is 5.310720 while the corresponding upper bound [I(10)] value at 5 per cent level of significance is 3.49. this implies that the upper bound value is lesser than the f-statistics and as such, we reject the null hypothesis of no cointegration. Having established that there is a long run relationship among the variables, we go ahead to estimate the levels form and the error correction form of the models.

Table 3: Bounds Test for Cointegration

Test Statistics	Value	K=4
F- Statistics	5.310720	
Critical Value Bounds Significance	I(0)	I(1)
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

*Source: Author's computation using e-views 10, 2020.*

*Interpretation of Results*

The levels form (long run estimates) of the variables is presented in Table 4. The estimates show that all included variables have negative relationships with the dependent variable. From the result, oil price positive shocks has a coefficient of -2.370305 which implies that a dollar increase in the price of crude oil brings about a decline of about 2.37 per cent in the balance of payments, while the negative crude oil price shock with a coefficient of -8.366916, shows that a dollar decrease in price of crude oil makes the balance of payments drop by about 8.37 per cent.

Likewise, oil export with a coefficient of -0.340606 implies that a billion naira increase in oil export brings about a 0.34 per cent decrease in balance of payments while the coefficient of exchange rates, which is -1.922646, means that a naira increase in the exchange rate makes the balance of payments to reduce by 1.92 per cent.

Table 4: Long-run Estimates

Dependent Variable: BOP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COP_POS	-2.3703	2.2937	-1.0333	0.3103
COP_NEG	-8.3669	4.1900	-1.9968	0.0556
OXP	-0.3406	1.9465	-0.1749	0.8624
EXR	-2.0848	2.9864	-0.6981	0.4909
C	-1.9226	5.9199	-0.3247	0.7478

Source: Author's computation from e-views 10, 2020.

A further look at Table 4 reveals that of all the regressors, only the negative shocks of crude oil prices is statistically significant at 10 per cent given its probability value of 0.0556 hence, the rejection of the null hypothesis, while on the other hand, other regressors are insignificant in explaining balance of payment in the long run.

Table 5 presents the short run and error correction estimates. A cursory look reveals that only balance of payment from previous one year and positive shocks crude oil prices were included in the estimate and they were both significant, judging from the t-statistics. The coefficient of previous year balance of payment is 0.246901 which implies a positive relationship with current period balance of payment where a per cent increase in last year's balance of payment brings about an increase by 0.25 per cent in this year's balance of payments while positive crude oil shocks have a positive relationship with balance of payments as well judging from its positively signed coefficient. A dollar increase in crude oil prices brings about a 16.85 per cent increase in balance of payments in the short run.

The error correction term, denoted as *CointEq (-1)*\* which is the speed of adjustment towards long run equilibrium is appropriately signed and significant given its probability value of 0.00001. Its coefficient of -0.594586 implies that in the case of a disequilibrium in the system, it gets adjusted at a speed of 59.5 per cent. The R-squared value of 0.613190 shows that about 61.3 per cent of the variations in balance of payment are explained by the variables included in the model.

Table 5: Short-run Estimates

Dependent Variable:  $\Delta$ BOP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(BOP(-1))	0.246901	0.116552	2.118388	0.0431
D(COP_POS)	16.85268	2.849223	5.914834	0.0000
CointEq(-1)*	-0.594586	0.097025	-6.128162	0.0000
$R^2 = 0.613190$ , Adj. $R^2 = 0.589747$ , Durbin-Watson stat = 2.110977				

Source: Author's computation from e-views 10, 2020.

#### Discussion of Findings

The results reveal a long run relationship among the variables with an error correction of about 59.5 per cent. This implies that the balance of payments adjusts quickly to shocks generated from the system in the model. This may be because the variables included are closely related to the workings of the balance of payments. The estimates obtained reveal that in the short run, only the positive shocks of



crude oil prices are important to balance of payments. This is related to the supply theory which states that suppliers increase supply in times of higher price so as to be able to make more profit from the higher prices. The case of crude oil is such that, its strategic placement as a universal product with numerous derivatives have made its demand to be price inelastic and as such, even at higher prices, importers have no choice than to keep importing while the exporters enjoy windfall gains which reflects on their trade balances. This finding is in accordance with Sakanko *et al.* (2019) which contradicts Afolabi (2019).

The long run estimates however, reveal that all included regressors except negative shocks of oil prices, are not significant. The combination of exchange rate and oil export being insignificant contradicts the Marshal-Lerner condition. The negative effect of negative crude oil shocks in line with the initial estimate obtained for the positive shocks in the short run. In the long run, when the crude oil prices fall, importers may have put in place mechanisms to enable them reduce importation so as to force the price further down while the Nigerian government will elect to stay their supply also. This leads to reduction in the trade balance and consequentially, the balance of payments. This finding supports the findings of Broni-Bediako *et al.* (2018) and contradicts Afolabi (2019). The absence of net crude oil export and exchange rates from the short run estimates and the insignificant estimates in the long run indicate that the Marshall-Lerner condition does not hold for Nigeria during the period of study as Nigerian crude oil export accounts for a very small portion of the global export.

*Model Diagnostic*

The results in Table 5 are for diagnostic tests carried out to assess the model’s fit and reliability of estimates. It is seen from Table 6 that, all tests have probability values greater than 5 per cent and as thus, the null hypotheses cannot be rejected thereby implying that the model is free from serial correlation, heteroskedasticity, specification bias as well as non-normality.

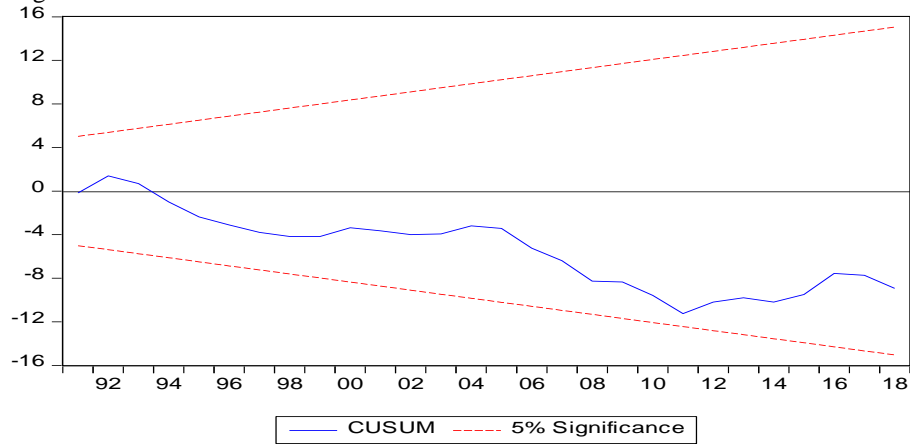
Table 6: Model Diagnostic

Test Statistics	P-value
Serial Correlation: Chi-Square(2)	0.7041
Heteroskedasticity: Chi-Square(7)	0.7721
Normality: Jarque-Bera	0.7691
Specification Error: F-statistic(2, 26)	0.1371

*Source: Author’s computation from e-views 10, 2020.*

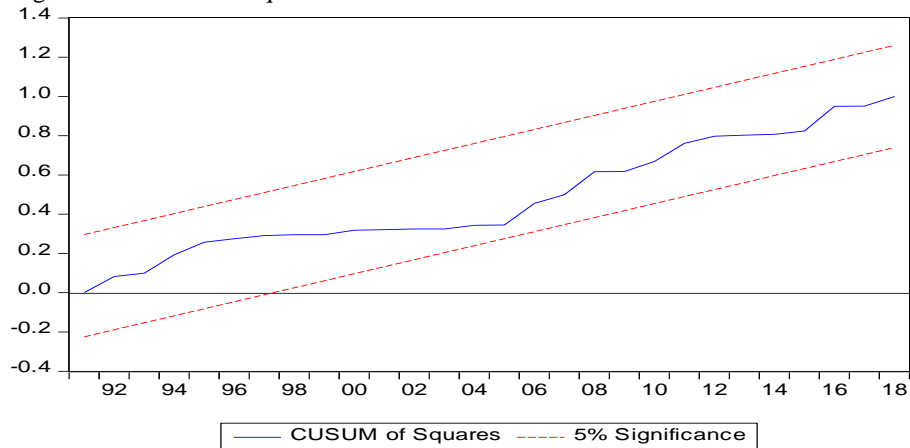
Further look at the cumulative Sum (CUSUM) test and the cumulative sum of squares tests for stability, reveals that the model is of good fit and is stable over time because in both figures 2 and 3, the trend line did not exceed the upper and lower 5 per cent boundary.

Figure 2: CUSUM Test



Source: Author's computation from e-views 10, 2020.

Figure 3: CUSUM of Squares Test



Source: Author's computation from e-views 10, 2020.

## 5. Conclusion and Recommendation

The study used the non-linear ARDL to estimate the impact of crude oil price asymmetry on balance of payments in Nigeria from 1982 to 2018. The results showed evidence of cointegration between balance of payments and the included regressors. Estimates from ARDL (2, 1, 0, 0, 0) reveal that there was an asymmetric response of balance of payments to crude oil prices where in the short run, balance of payments responds positively to crude oil price increases while in the long run, it responds negatively to crude oil price decrease. This implies that any drop in crude oil prices will definitely generate a deficit balance in the balance of payments, while increase in crude oil prices will create a surplus from large trade balance. This implies that Nigeria balance of payments position is largely

dependent on crude oil prices, which is not determined by forces within the country.

Based on the findings, the study thereby suggest that, the government should look in developing other alternatives sectors, by encouraging local production of agricultural and other manufactured consumer goods that can be produced within the country for export; so as to have a soft landing for the effects of crude oil price change.

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## **The Feedback effects of Exchange Rate Pass-through Inflation on sustainable Development in Nigeria**

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### **Abstract**

*The Nigerian Naira has become largely unstable due to the import-dependent nature of the economy and its over-reliance on oil revenues. The feedback effect of exchange rate pass-through inflation on sustainable development in Nigeria is the aim of the study. Annual time series data over the period of 1980 to 2018 from Central Bank of Nigeria statistical bulletin were collected and the Structural Vector Autoregressive (SVAR) estimation technique was employed in the analysis. The outcome indicates that inflation had a significant positive impact on sustainable development while interest rate has a negative significant impact on inflation in Nigeria. The study concluded that inflation had a positive, substantial influence on sustainable development and that the exchange rate had a long-term inflation relationship. The study therefore, recommends that excess dependency on primary commodities as a source of foreign exchange should be minimized by ensuring that value is added to all primary commodities before being traded abroad to reduce the country exposure to disturbances in the international commodity markets and improve the value of the local currency.*

**Keywords:** Inflation, Exchange rate pass-through, Interest rate, Sustainable development, VECM

**JEL Classification:** E43, P44, Q01

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### **1. Introduction**

The new development model is sustainable development, as launched by the United Nations (UN) in 2015 and embraced by world leaders with a priority on ensuring healthier lives for everyone by 2030 following the expiration of the Millennium Development Goals (MDGs) in 2015 (Ssozi & Amlani, 2015). It is described as 'growth that meets the needs of the present generation without sacrificing the capacity of the future generation to meet their own needs' (World Commission on

Environment and Development, 1987). To a greater degree, this form of development depends on access to adequate and inexpensive supplies of goods and services. Hence, two of the seventeen (17) goals of sustainable development which relate to the eradication of poverty and hunger, as well as the achievement of improved health care and education, rely on access to adequate and inexpensive supplies of goods and services (Environmental Management, 2017).

The trend in purchasing power otherwise refers to inflation and its stability or otherwise primarily depends on the direction of movement in the exchange rate and how sensitive domestic prices are to changes in the exchange rate referred to as the pass-through exchange rate (ERPT) (Akofio-Sowah, 2009). Despite the reliance of stability in inflation on the exchange rate and the pass-through exchange rate, an increase in prices triggered by an exchange rate shock in a low inflation setting may not push companies to increase the price of their products because price increase would make the company less competitive. If the organization considers the price shock to be temporary, it will bear the cost spike by reducing its mark-up, and therefore its profit margin to keep the price steady (Taylor, 2000).

While the exchange rate has external consequences on the economy, such as its effect on trade and capital transfers, one of the most serious internal effects of the exchange rate on the economy is its effect on inflation, officially referred to as the pass-through exchange rate (ERPT) for inflation (Vo, 2009). On the one side, when the pass-through exchange rate is low, international importers will not want to adjust prices due to the shock from the exchange rate, while companies will be able to adjust prices in the event of a high pass-through exchange rate in response to the shock from the exchange rate. The pass-through of the exchange rate thus defines the purchasing capacity of foreign exporters. Also, the monetary authority's management of monetary policy relies, in addition to inflation forecasting capability, on the degree of exchange rate pass-through in the economy. Therefore, when the degree of the pass-through exchange rate is considered low, the monetary authority will be less concerned with the inflationary impact of exchange rate shocks, while the monetary authority will be less concerned with the inflationary effect of exchange rate shocks in the case of an assessed high degree of exchange rate pass-through (Vo, 2009).

Due to the import dependent nature of the Nigerian economy and her over-reliance on oil proceeds, the Nigeria Naira has been relatively unstable when compare with the basket of world currency and ever since 1970s Naira till date Naira has depreciated magnificently and this has eroded the consumer purchasing power with its adverse implication on sustainable development. The persistent depreciation of the Nigeria exchange rate trended with major economic variables such as inflation, GDP growth, and fiscal deficit/GDP ratio. In this context, the exchange rate movement trended with inflation rate.

Because of the Nigerian economy's import-dependent attributes and her over-reliance on oil revenues, the Nigeria Naira exchange rate has been comparatively unstable compared to the world currency basket, and Naira has depreciated magnificently since the 1970s to date, eroding consumer buying power with its

adverse effect on sustainable growth. The persistent depreciation of the Nigerian exchange rate has been trending with major economic variables such as inflation, GDP growth, and fiscal deficit/GDP ratios. In this sense, exchange rate movement had trended with the inflation rate. During the periods of high inflation rate, volatility in the exchange rate was high, which was also reversed in a period of relative stability (Eme and Johnson, 2013). Data from the Central Bank of Nigeria statistical bulletin indicated that the pace of sustainable development in Nigeria as proxy gross domestic per capital has been increasing sluggishly from 1980 to 2018 while inflation rate over the period fluctuated significantly upward and downward. Meanwhile, Naira exchange rate over the entire period has been rising and falling in an increasing direction.

Recently, there has been a rising concern in exploring the relationship between exchange rates pass-through, monetary policy behaviour and the inflationary climate. Most of the current studies are focused on cross-country analysis without considering the country-specific effect of the relationship among the variables (see Campa and Goldberg, 2001; Gagnon and Ihrig, 2001). Furthermore, most of these studies did not account for the effect on sustainable development of exchange rate pass-through inflation since the phenomena of sustainable development is a new paradigm, but have rather concentrated attention on other macroeconomic factors such as economic growth, interest rates, capital flows among others. This paper was inspired to resolve this gap by analyzing the feedback effects of exchange rate pass-through inflation on sustainable development in Nigeria, given the theoretical correlation between exchange rate pass-through inflation and sustainable development.

The broad objective of this study was to examine the effect of exchange and inflation on sustainable development in Nigeria. The specific objectives are to estimate the relationship among exchange, inflation and sustainable development in Nigeria; investigate the response of sustainable development to exchange rate pass-through inflation in Nigeria; and to examine the effect of monetary policy proxy by interest rate on sustainable development in Nigeria.

The content of this study is organized as follows. After this introduction section is section two which focus on the review of previous literature. Section two, is succeeded by section three which presents the methodology employed while section four analyse the result, discussion of findings and conclusion

## **2. Literature Review**

### *Conceptual Review*

The notion of exchange rate pass-through, inflation and economic growth is conceptualized for clarification. Inflation has been described in the literature from various viewpoints. Thirwal (1974), describes inflation as an increase in the general price level of goods and services arising from an increase in import rates or output costs. It is an overall and constant rise in the aggregate level of prices of goods and services (Morris and Morris, 1999). In Jhingan's (2005) view, inflation reflects a steady and appreciable increase in the average price level of goods and services. Inflation is a percentage rise in local currency import rates arising from a one

percent change in the exchange rate between the importing country and the exporting country, according to Akofio-Sowah (2009). In five key categories of inflation models comprising monetarist model, pure cost model, hybrid model which comprises of demand and cost components, structural models and expectation models, Thirwal (1974) identified five mixed factors that cause inflation. Meanwhile, in evaluating a single inflation experience, it is very difficult to differentiate between these models since they come as a result of many forces interacting with each other. The International Monetary Fund states measured inflation using the consumer price index (CPI) of a country, which calculates the average cost of living expenses of consumers for a year (The Economic Times Magazine August, 2010).

On the other end, the ratio between a unit of one currency and that of another currency for which the unit can be traded at a given time is the exchange rate. The Civil Society Budget Advocacy Organization (2015) describes exchange rate as the price of a country's currency weighted against that of the currency of another country. It is the rate at which one currency can be traded for another. Exchange rate pass through is a term used to describe the impact of exchange rate fluctuations on a country's domestic markets and the consequences that this would have on the central bank's policy-making decisions (Campa and Goldberg 2005). As specified by Mumtaz et al (2006), exchange rate pass-through (ERPT) is the percentage change in local currency import prices following a one-percent change in the exchange rate between importing and exporting countries. According to Barhoumi (2005), "ERPT can statistically be represented as the elasticity of import prices to a change in exchange rates".

#### *Theoretical Review*

The law of one price (LOOP) and purchasing power parity (PPP) is the primary theoretical basis for the existence of exchange rate pass-through (Eckstein and Soffer, 2008). The law is based on the position that changes in exchange rates that would lead to changes in the price of commodities in the local economy. Consequently, a shift in the exchange rate which is not preceded by a change in the price of commodities in the local economy will be called a deviation from the LOOP. It is also expected that demand and supply processes would bring about the required shift in local markets to bring international and domestic prices back to the same level. According to this assumption, if the market is sufficiently free, exchange rate pass-through can be absolute or close to 100% in the very long run. For most nations, though, most scientific research have considered ERPT to be incomplete (Soffer, 2008).

The central principle behind the PPP theory is that arbitrage in the commodity market equalizes prices globally once the prices of goods are calculated in the same currency (Pilbeam, 1998). The law of one-price (LOP) is the building block of the PPP, which clearly states that in the absence of a competitive market system and transport costs, quotas, tariffs and other exchange restrictions, trade and successful arbitrage in the goods markets will guarantee the same price across countries. The LOOP is based on the principle of perfect goods arbitrage. Arbitrage exists where pricing disparities are manipulated by economic actors to have a risk less profit.



The PPP adherent argued that the exchange rate must adjust, to ensure that the LOOP holds for an identical bundle of goods in international market. When the price of a good differs in the market of two countries, there is an incentive for individuals seeking profit to purchase the goods in the low price market and resell it in the high price market. Similarly, if a market basket containing many different goods and services costs more in one market than another, profit-seeking individuals should be expected in the low-cost market to buy the relatively cheaper goods and resell them in the higher-priced market. If the one-price law leads to the equalization of prices of a commodity between two markets, then it seems reasonable to conclude that PPP should also hold, describing the equality of market baskets between countries.

#### *Empirical Review*

There is a growing interest in examining the relationship between the pass-through exchange rate, monetary policy behavior and the inflationary environment in the literature. For instance, Razafimahefa (2012), study exchange rate pass-through domestic prices and its determinants in sub-Saharan African countries from 1985 to 2008 auto-regressive (AR) and error correction estimation techniques. The analysis indicates that the pass-through is imperfect and that after a contraction, it is higher than a local currency appreciation. In the same vein, in Singapore economy, Chew, Ouliaris and Meng (2009) examine exchange rate pass-through while facilitating asymmetric pass-through effects using Band-pass spectral regression techniques across the economic cycle from 1980:Q3 to 2010:Q3. The study finds that the pass-through of the first step of the exchange rate to domestic import prices is complete, with adjustments in the exchange rate completely expressed by the fourth quarter of the shock in domestic import prices. By contrast, the second stage of the pass-through, which includes the transition of market prices to a change in domestic import prices, is more drawn-out. Consequently, the net pass-through of the exchange rate to consumer prices is reasonably moderate. The study further indicates the existence in the market cycle of asymmetric pass-through impacts.

In another report, Loloh (2014) used a recursive VAR to estimate the pass-through effect on domestic prices of exchange rate fluctuations between January 1994 and December 2012. The study shows that the effect of a nominal exchange rate shock on domestic prices is incomplete, usually moderate and decreases within 18-24 months, but these effects are felt mainly within 12 months. In general, the effect on total CPI inflation of the exchange rate shock is more benign than that of non-food inflation. In support of Taylor's theorem, there is also proof that the pass-through exchange rate is positively associated with the degree of inflation. Via the Vector Autoregression (VAR) method, Aleem (2012) explores the exchange rate pass-through to domestic prices to approximate the scale of the exchange rate pass-through to consumer prices. The empirical findings show that the pass-through exchange rate in Latin American countries is higher than in Asian countries and that monetary policy often plays a role in imports. Since an explicit inflation tracking monetary strategy was introduced, the exchange rate pass-through deteriorated. Similarly, using quarterly data from 1993: Q1 -2008: Q4 using vector error correction model correction, Mnjama (2011) investigates the magnitude and

speed of exchange rate pass-through (ERPT) to domestic prices in Kenya (VECM). The findings showed that Kenya's ERPT is incomplete but in the long term, relatively poor at around 36%. In terms of asymmetry, the findings have shown that ERPT is greater than depreciation in times of appreciation.

In the same vein, using 1979-2000 data for 71 nations, Choudhri and Hakura (2003) derive a pass-through relationship based on modern open economy macroeconomic models. The research finds clear evidence of a positive and essential correlation between the pass-through and the average inflation rate across countries and times, using the VECM process. In addition, the inflation rate exceeds other macroeconomic considerations in clarifying cross-regime disparities in the pass-through. The nonlinear augmented modern Keynesian Phillips curve for Nigeria is calculated by Bello and Sanusi (2019) using the Smoot transition regression model over the period from 1995Q1 to 2018Q2. The outcome shows signs of towing inflation regimes over the period. In the low exchange rate depreciation system, food inflation, oil inflation, business marginal costs and product inflation account for much of the adjustments in the prices of the aggregate commodity basket. However as inflation switches to a high regime, the exchange rate merely describes market shifts in the aggregate commodity basket. Similarly, it has been shown that inflation changes in the system are largely caused by the depreciation or devaluation of the exchange rate. It was also clear that the exchange rate devaluation level that causes a policy transition from low to high inflation is around N75 relative to the dollar. Gidigbi, Babarinde and Lawan (2020) examine the effect on market inflation in Nigeria over the span of the exchange rate fluctuations pass through from 1981 to 2015. The VECM estimates suggest that the variables are relevant in granger causing inflation in the long-run. The long-run ECM coefficient reveals a relation of variance over one cycle and this is statistically important at one percent level. There was no short-term relationship between inflation and exchange-rate fluctuations, as was the case for government expenditures, imports, foreign direct investment, and access to trade. Money supply, though, indicates a strong short-run association with inflation.

### **3. Methodology**

#### *Research Design and Model Specification*

The paper incorporates quantitative analysis with ex post facto research. The study adapted the model used in the study carried out by Akpan and Atan (2014) on the impact of exchange rate fluctuations on real output growth in Nigeria, where the growth rate of real gross domestic product was the dependent variable and real exchange rate, interest rate and inflation rate. In line with the objective of this study, sustainable development proxy by gross domestic per capita was the dependent variable while real exchange rate, interest rate and inflation rate were used as the explanatory variables in the model. The functional model is defined as follows:

$$GDPC = F(INFL, EXR, INTR) \dots\dots\dots 1$$

The transformation of the model into a VAR model is expressed in a system as:

$$\begin{aligned}
 \text{GDPC}_t &= c_1 + \sum_{i=1}^p \pi_{11i} \text{GDPC}_{t-i} + \sum_{i=1}^p \pi_{12i} \text{INFL}_{t-i} + \sum_{i=1}^p \pi_{13i} \text{EXR}_{t-i} + \sum_{i=1}^p \pi_{14i} \text{INTR}_{t-i} + \mu_{1,t} \dots\dots 2 \\
 \text{INFL}_t &= c_1 + \sum_{i=1}^p \pi_{11i} \text{INFL}_{t-i} + \sum_{i=1}^p \pi_{12i} \text{GDPC}_{t-i} + \sum_{i=1}^p \pi_{13i} \text{EXR}_{t-i} + \sum_{i=1}^p \pi_{14i} \text{INTR}_{t-i} + \mu_{1,t} \dots 3 \\
 \text{EXR}_t &= c_1 + \sum_{i=1}^p \pi_{11i} \text{EXR}_{t-i} + \sum_{i=1}^p \pi_{12i} \text{GDPC}_{t-i} + \sum_{i=1}^p \pi_{13i} \text{INFL}_{t-i} + \sum_{i=1}^p \pi_{14i} \text{INTR}_{t-i} + \mu_{1,t} \dots\dots 4 \\
 \text{INTR}_t &= c_1 + \sum_{i=1}^p \pi_{11i} \text{INTR}_{t-i} + \sum_{i=1}^p \pi_{12i} \text{GDPC}_{t-i} + \sum_{i=1}^p \pi_{13i} \text{INFL}_{t-i} + \sum_{i=1}^p \pi_{14i} \text{EXR}_{t-i} \dots\dots\dots 5
 \end{aligned}$$

The VAR (p) system equation (2) to equation (5) can be represented in a reduced form within a matrix framework as:

$$\begin{bmatrix} \text{GDPC}_t \\ \text{INFL}_t \\ \text{EXR}_t \\ \text{INTR}_t \end{bmatrix} = \begin{bmatrix} c_1 \\ c_2 \\ c_3 \\ c_4 \end{bmatrix} + \sum_{i=1}^p \begin{bmatrix} \pi_{11} & \pi_{12} & \pi_{13} & \pi_{14} \\ \pi_{21} & \pi_{22} & \pi_{23} & \pi_{24} \\ \pi_{31} & \pi_{32} & \pi_{33} & \pi_{34} \\ \pi_{41} & \pi_{42} & \pi_{43} & \pi_{44} \end{bmatrix} X \begin{bmatrix} \text{GDPC}_{t-i} \\ \text{INFL}_{t-i} \\ \text{EXR}_{t-i} \\ \text{INTR}_{t-i} \end{bmatrix} + \begin{bmatrix} \mu_{1,t} \\ \mu_{2,t} \\ \mu_{3,t} \\ \mu_{4,t} \end{bmatrix}$$

The expected signs of the coefficients of the explanatory variables are summarized in terms of differentials as follows: Inflation is expected to exert a negative effect on sustainable development proxy by GDPC in Nigeria i.e.  $\frac{\partial \text{GDPC}}{\partial \text{INFL}} < 0$ ; exchange rate is expected to exert a negative effect on sustainable development proxy by GDPC in Nigeria i.e.  $\frac{\partial \text{GDPC}}{\partial \text{EXR}} < 0$ ; interest rate is expected to exert a negative effect on sustainable development proxy by GDPC in Nigeria i.e.  $\frac{\partial \text{GDPC}}{\partial \text{INTR}} < 0$

*Source and Measurement of Data and Estimation*

Given the nature of the models, it is imperative to collect data to estimate the stochastic equations. The periods between 1980 and 2018 were covered by the data series. The data was obtained from the publication of Central Bank of Nigeria (CBN) Statistical Bulletin. Inflation was proxy by core and food that is all items minus farm produce: CPI twelve months average, exchange rate was proxy by average Naira cross exchange rates to US Dollar, interest rate was proxy by weighted average lending and deposit rate while Gross Domestic Per Capital measured sustainable development (GDPC)

In the analysis, the Jarque-Bera normality test and test for multicorrelation were carried in the preliminary analysis. In the actual estimation, the study used the Structural Vector Auto-Regression model (SVAR) to capture the level of ERPT and its transmission into domestic prices unlike most of the empirical studies that tackled the pass-through effect in line with a well-quoted study of McCarthy (2002) which used the VAR method to examine the pass-through effect of exchange rate and import price changes into producer (PPI) and consumer (CPI) inflation. The methodology was firstly proposed by Sims (1980) to determine the proportion of the price level variance that can be explained by the changes in exchange rate. Recent empirical studies preferred to use SVAR models as VAR models were criticized of being devoid of any economic content. The SVAR models provide historical decompositions that measure the cumulative contribution of each structural shock to the evolution of each variable over time (Omneia, Mona & Kholoud, 2010).

#### 4. Results

Table 1 presents the result of the Jarque-Bera test of normality for the descriptive evaluation of the data and establish the nature of the distribution of the data.

Table 1: Descriptive statistics

	GDPC	INFL	EXR	INTR
Mean	30294002	20.04444	69.56610	20.89444
Median	22060982	12.30000	21.96860	21.17000
Maximum	69023930	72.80000	193.2792	36.09000
Minimum	13779255	4.700000	0.570000	10.00000
Std. Dev.	17253201	18.26759	66.40632	6.066190
Skewness	0.985031	1.497571	0.272821	0.029324
Kurtosis	2.591488	3.964889	1.368230	3.001837
Jarque-Bera	6.072038	14.85284	4.440595	0.005165
Probability	0.048026	0.000595	0.108577	0.997421
Sum	1.09E+09	721.6000	2504.380	752.2000
Sum Sq. Dev.	1.04E+16	11679.67	154343.0	1287.953
Observations	37	37	37	37

Source: Authors' Computation, 2020

The result of the descriptive analysis as presented in Table 1 showed that all the variables in the data set are positively skewed since their means are greater than their medians. The skewness coefficient of inflation which is greater than one indicates that among all the variables it is only inflation that is highly symmetrical. The positive values of the kurtosis of all the variables established that the variables are all leptokurtic in nature. The values of the Jarque-Bera statistic showed that while exchange rate and interest rate are not normally distributed, sustainable development and inflation are normally distributed since their p-values are statistically significant at 5% level of significance.

Table 2: Correlation Analysis Matrix

	GDPC	INFL	EXR	INTR
RGDP	1.000000			
INFL	-0.353704	1.000000		
EXR	0.906180	-0.403556	1.000000	
INTR	0.189430	0.173673	0.196251	1.000000

Source: Authors' Computation, 2020

The results of the correlation analysis of the set of variables in the model as presented in Table 2 showed that the correlation coefficients for the relationship among the variables sustainable development, inflation, exchange rate and interest rate is not very strong indicating the absence of the problem of multicorrelation among the independent variables. The result also shows that while the association between exchange rate, interest rate and sustainable development is positive, the association between sustainable development and inflation was negative.

*Trend Analysis*

The trend of sustainable development, inflation and exchange rate in Nigeria is presented using the line graph as follows:

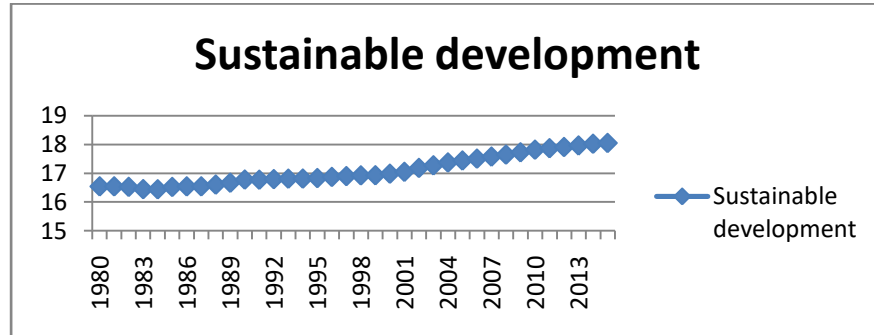


Figure 1: Trend of Sustainable Development 1980-2018

Source: Authors' Computation, 2020

The trend analysis as shown in Figure 1 shows that sustainable development in Nigeria throughout the entire period has increased slowly. Based on data from Central Bank of Nigeria statistical bulletin, the pace of sustainable development in Nigeria as proxy by GDP per capital between falls from 1982 to 1984 and later rose slowly from 1985 to 1988. There was another increase but more sharply in sustainable development between 1988 and 1990. Between 1990 and 2000 the rise in sustainable development was also meagre. However, from 2000 to 2014 there was a rapid increase in the pace of sustainable development in Nigeria.

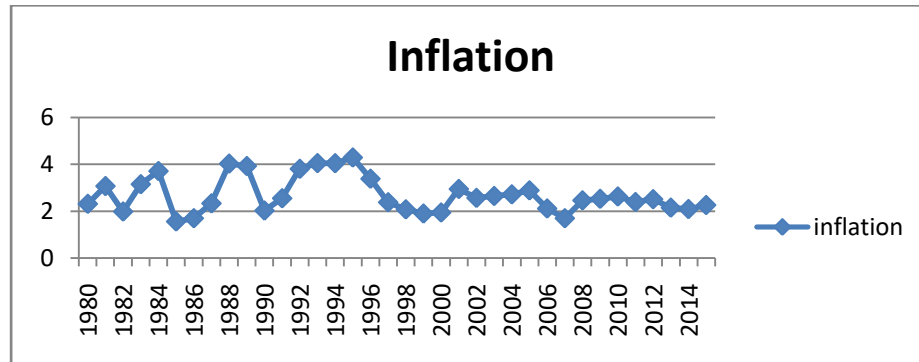


Figure 2: Trend of inflation in Nigeria 1980-2018

Source: Authors' Computation, 2020

The trend analysis as shown in Figure 2 indicates that inflation had fluctuated significantly upward and downward over the entire period. The data on inflation also shows that between 1980 and 1981 there was an upsurge in inflation rate in Nigeria followed by a sharp decline between 1981 and 1983. Between 1983 and 1984 and sharp increase occurred before a further increase between 1984 and 1985. There was another fall in inflation rate between 1985 and 1986. Inflation rate further rise slowly from 1986 to 1988 before a small decline between 1988 and 1989.

Furthermore, inflation decline sharply from 1989 to 1990 and rose slowly from 1990 to 1995 and later on between 1995 and 2000 inflation decline very sharply but thereafter up till 2014 there has been upward and downward decline in inflation rate in Nigeria

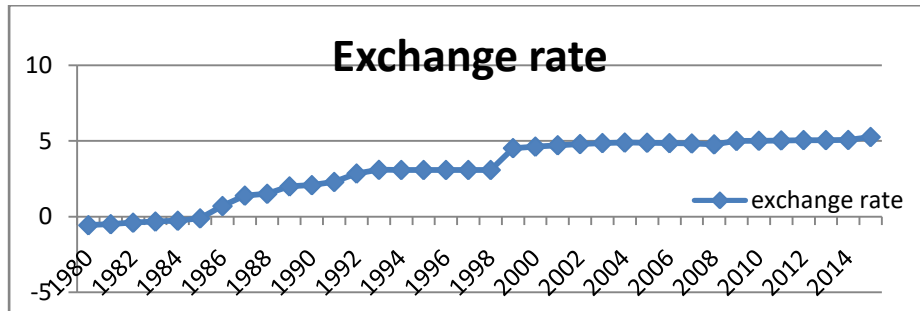


Figure 3: Trend of exchange rate in Nigeria 1980-2018

Source: Authors' Computation, 2020

Figure 3 shows that the Naira exchange rate which has increase rapidly over the entire period has been rising and falling in an increasing way. It is evident from figure 1, 2 and 3 that over the entire period there is a significant variation in the trend of sustainable development, inflation and exchange rate in Nigeria.

*Empirical Result*

The Table 1 below presents the result of the stationary tests of the variables in the model based on the Augmented Dickey Fuller (ADF) and Phillip Perron (PP) unit root tests. The tests were carried out at level and first differences.

Table 3: Unit root test

Variables	Level		First difference		I(d)
	ADF	PP	ADF	PP	
RGDP	-1.503391	-1.143849	-12.29850*	-11.18383*	I(1)
INFR	-3.893772*	-2.303103**	-1.643997	-1.313966	I(0)
INTR	-1.850066	-2.359728	-2.777683***	-2.919307***	I(1)
EXR	-1.086518	-1.094125	-6.593149*	-6.593149*	I(1)

Note: \* represents 1% significant level; \*\* represents 5% significant level and \*\*\* represents 10% significant level. Calculated at trend and lag lengths selected automatically using the Schwarz info criterion (SIC)

The Result in Table 3 indicates that inflation is stationary at level while all other variables; sustainable development, interest rate, and exchange rate were non stationary at level but after taking the first difference the variables become stationary using both the Augmented Dickey Fuller (ADF) and Phillip Perron (PP) unit root tests.

The VECM is therefore used to examine the relationship among exchange rate, inflation and sustainable development in Nigeria since it is not all the variables that are stationary at level which show tendency for cointegration among the variables.

Table 4: Vector Error Correction Estimates

Dependent variables→	$\Delta$ GDP	$\Delta$ INF	$\Delta$ EXR	$\Delta$ INTR
CointEq1	-0.002146 (0.00272) [ 0.78865]	-0.355442 (1.16486) [-4.59751]*	-2.774737 (1.12380) [-2.46907]*	0.166360 (0.47321) [ 0.35156]
$\Delta$ RGDP <sub>t-1</sub>	0.701881 (0.15055) [ 4.66199]*	-192.0704 (64.4369) [-2.98075]*	-39.66401 (62.1656) [-0.63804]	-5.904321 (26.1767) [-0.22556]
$\Delta$ INFL <sub>t-1</sub>	0.000789 (0.00037) [ 2.13593]*	0.171859 (0.15808) [ 1.08714]	0.134377 (0.15251) [ 0.88110]	-0.086881 (0.06422) [-1.35288]
$\Delta$ EXR <sub>t-1</sub>	0.000857 (0.00049) [ 1.74367]	-0.345992 (0.21027) [-1.64545]	-0.151886 (0.20286) [-0.74872]	-0.056032 (0.08542) [-0.65595]
$\Delta$ INTR <sub>t-1</sub>	0.001557 (0.00126) [ 1.23957]	-1.342868 (0.53749) [-2.49840]*	-0.208326 (0.51855) [-0.40175]	-0.315088 (0.21835) [-1.44305]
C	0.009147 (0.00943) [ 0.96964]	10.26070 (4.03744) [ 2.54139]*	8.205561 (3.89513) [ 2.10662]*	1.098446 (1.64016) [ 0.66972]
Diagnostic statistics				
R-squared	0.791791	0.453878	0.220456	0.212024
Adj. R-squared	0.701039	0.356356	0.081251	0.071314
F-statistic	5.419089	4.654111	1.583685	1.506816
Akaike AIC	-3.836205	8.282036	8.210268	6.480400
Schwarz SC	-3.566848	8.551394	8.479625	6.749758

Note: Standard errors in ( ) & t-statistics in [ ]

Source: Authors' Computation, 2020

The estimates of the VECM as presented in Table 4 show that there is statistical evidence that changes in sustainable development which is influenced significantly by changes in inflation ( $\beta=0.000789$ ,  $t=2.13593$ ) and  $P<0.05$ ) and its own shocks as shown in column one. The result also indicates that changes in sustainable development ( $\beta=-192.0704$ ,  $t=-2.98075$ ) and interest rate ( $\beta=-1.342868$ ,  $t=-2.49840$ ) significantly influence changes in inflation. Hence, it is evident that while inflation has a positive significant effect on sustainable development ( $\beta=0.000789$ ,  $t=2.13593$ ), sustainable development ( $\beta=-192.0704$ ,  $t=-2.98075$ ) and interest rate ( $\beta=-1.342868$ ,  $t=-2.49840$ ) exerts a significant negative effect on inflation in Nigeria.

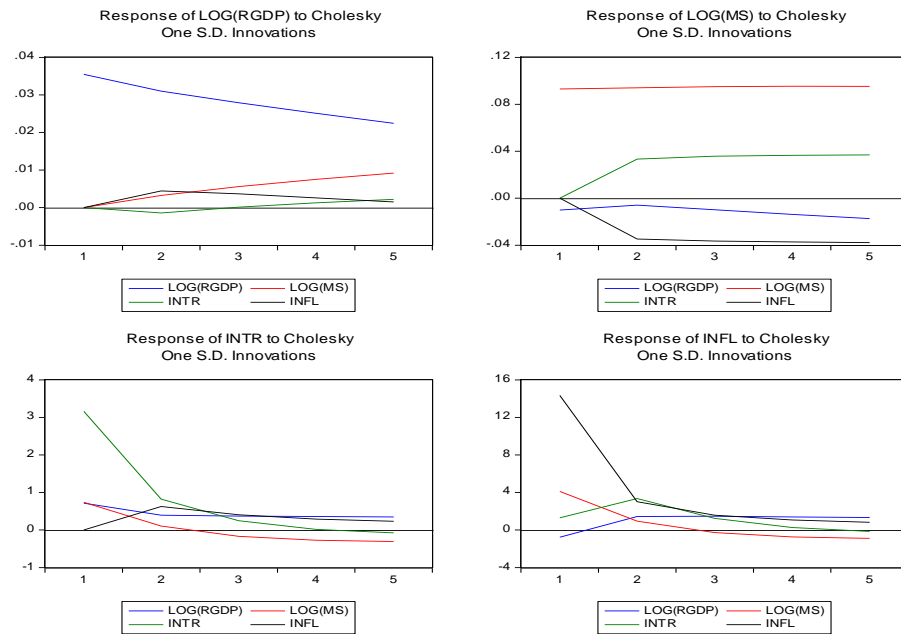
The result also shows that the speed of adjustment co-efficient for inflation in the model has a negative sign and the magnitude of the coefficient of error correction term lies between zero and one. This shows that 36% of the short run

disequilibrium adjusts to the long run equilibrium each year for exchange rate. The significance of the error correction term indicate that the speed of growth model to converge to the long run equilibrium point exist and moderate. This implies that exchange rate have a long-run pass through relationship with inflation.

*Impulse Response Function*

The impulse response function was used to investigate how economic growth respond to shocks in monetary policy. The results of the impulse response between sustainable development and exchange rate pass through to inflation are presented in figure 4 below:

Figure 4: Impulse Response Function: Sustainable Development and Exchange Rate Pass-through to Inflation



Shocks in inflation lead to a long term decrease in sustainable development as proxy by GDPC as shown in figure 4 above. The improvements in inflation resulted in a sharp decrease in sustainable development in the second year to the third year, but later remains under the steady state with a new equilibrium state implying permanent effect from the third to the fourth year after which there was a sharp increase in sustainable development in the fifth year. Shocks in exchange rate also leads to a rise in inflation and a decline in interest rate below the steady state.

*Discussion of Findings*

The estimates of the VECM show inflation has a positive significant effect on sustainable development ( $\beta= 0.000789, t= 2.13593$ ) while sustainable development ( $\beta=-192.0704, t=-2.98075$ ) and interest rate ( $\beta=-1.342868, t=-2.49840$ ) exerts a



significant effect on inflation in Nigeria. The significance of the error correction term (ECM(-1)) -0.002146 indicate that the speed of sustainable development model to converge to the long run equilibrium point exist at 0.21% speed of adjustment. This implies that exchange rate have a long-run pass through relationship with inflation.

By and large our result established that inflation has a positive significant effect on sustainable development and that exchange rate have a long-run pass through relationship with inflation. This result corroborated the findings in the study conducted by Ogundipe and Egbetokun (2013) on the effect of exchange rate shocks in consumer prices. The study found a substantially large exchange rate pass-through to inflation in Nigeria. Finding shows that exchange rate has been more important in explaining Nigeria's rising inflation phenomenon than the actual money supply. It also corroborated the study of Wattanakoon (2011) on the degree of pass through and short-run exchange rate adjustment toward long-run equilibrium to verify what monetary authority should do during the years of economic turbulence. The study found that there will be 4.7% of pass through from exchange rate to price level in Thailand and the error of the deviation from the actual value of inflation will be corrected by 14.06% in each period. The result also supported the findings of Umaru and Zubairu (2012) on the impact of inflation on economic growth and development in Nigeria between 1970-2010..The results also revealed that inflation possessed a positive impact on economic growth through encouraging productivity and output level and on evolution of total factor productivity. A good performance of an economy in terms of per capita growth may therefore be attributed to the rate of inflation in the country.

### **5. Conclusion and Recommendation**

This study concluded that inflation had a positive significant effect on sustainable development and that exchange rate had a long-run pass through relationship with inflation. This result implies that despite the high and unstable level of inflation in Nigeria, its implication on sustainable development has been encouraging and desirable. This surprising result can be attributed to the position that a moderate level of inflation is necessary of sustainable development and to the prudence fiscal and monetary policy management of the government. Following the empirical findings, the following recommendations are made for effective policy formulations. Nigeria should cut-down her excessive dependence on primary commodities as a major source of foreign exchange by ensuring that value are added to all primary commodities before traded in international market to reduce the country exposure to disturbances in the international commodity markets and improve the value of her currency. Also policy makers need to control the volatility of the Naira exchange rate so as to ensure stable retail price levels. Finally, policy makers needs to also introduce policies that will boost the level of output in Nigeria by improving productivity/supply in order to reduce the prices of goods and services (inflation) so as to boost the growth of the economy.

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## **Relationship between Financial Inclusion and Economics Growth in Nigeria: Evidence from: 2006 – 2018**

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### **Abstract**

*The study estimated the impact of financial inclusion variables on economic growth in Nigeria for the periods 2006–2018. The variables selected include access to bank credit; number of bank branches; number of automated teller machines/mobile bank users and point of sale (POS). The study adopted the ADF test for stationarity of the variables and ARDL estimation was also conducted to obtain the long and short run coefficients of the variables of the study. On the basis of the result, it was found that access to bank credit has significant positive relationship with GDP growth in Nigeria. The study further concludes that GDP growth has a strong positive relationship with the branch network as well as the number of ATM/mobile money users/accounts while the relationship between GDP growth and number of POS shows that the number of POS users is weak and has no economic value on the economic growth. The study recommended that government should encourage banks to further increase the number of POS available to customers so as to strengthen the ease of financial access to all bankable persons; also, there is need for banks to increase their number of branches and ATMs in order to enhance access and availability of bank credit to bankable individuals in the country.*

**Keywords:** Financial Inclusion, Bank, Credit, POS, ATM

**JEL Classification:** E51, N2, O14

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### **1. Introduction**

The plan to achieving economic growth has preoccupied the policy thrust of all countries in the world. Nigeria as a developing country suffers the consequences of low level of economic activities evidenced by low productivity (Smart, 2014). Studies in this area discern strongly that financial sector development holds significantly the key to economic growth; studies such as Schumpeter and Mckinnon-Shaw hypothesis introduced finance variable into the growth factors and opined that adequate quantum of finance is needed to procure effective labour resources and new technologies to increase the output of goods and services (Schumpeter, 1912; McKinnon, 1973; Shaw, 1973). Growth propellants such as

technology and human capital development are made possible through finance development (Ndebbio, 2004).

Interestingly, economic theories espouse a positive correlation between financial development and economic growth. Shaw (1973), Mckinnon (1973) Levine and Zervos (1996), Goldsmith (1969), Bekaert et al (1995) in a finance-growth hypothesis show convincing evidence of positive correlation between finance and economic growth. In Nigeria, empirical studies of Adhlakun (2010), Odeniran and Udejaja (2010), Nkoro and Uko (2013), Osuji and Chigbuh (2012) and Anieken and Sikiru (2012) find evidence of positive relationship between financial inclusion and economic growth.

Nigeria's financial sector is still evolving but profoundly sustains the role of saving mobilization from the surplus spending units and canalizing same to the deficit spending units for investment purposes. The reward of efficient and effective financial system is increase in output of the economy through increase in investment. The economy needs a sustained boost in economic activities to further create employment, increase in income and raise aggregate demand for goods and services.

In the pursuance of the development of finance sector, the policy of financial inclusion was introduced to increase the access of bankable groups to the financial service net so as to increase the Country's liquidity position as well as widen credit access and implicitly increase investment.

Financial inclusion policy is an attempt to close the gap that hitherto existed between deficit spending unit and surplus spending unit powered by the intermediation function of the financial system. It is the policy that facilitates and increases access, usage and availability of financial services, provisions as well as increases the number of bankable groups in the financial system. The World Bank (2009) report describes financial inclusion as a process of raising individual access to basic financial services (saving, loans and insurance) in a safe and convenient manner especially among low income and more vulnerable income earners in the economy.

Financial inclusion as a policy is geared towards bringing the low income group into the Nigerian financial system net through a convenient less risky means and less cumbersome procedure into the financial net knowing that a viable and strong financial system definitely will boost the nation's economy. The World Bank group identified financial inclusion indicators to include ATM, POS, bank deepening (number of banks and their branches in the country), access to credit, information access, internet banking services. In a study by Mahanta (2009), capturing of the poor to the financial system will deter them from saving outside their homes or with informal system and encourage them to save in the banks thereby raising their chances to accessing credits from the formal financial institutions. Access to credits by the low income group will help them to overcome financial shocks as well boost their productions.

Financial inclusion is therefore a policy that is imbued with so much of accelerated strategy to boost economic growth especially in developing economy. It is not gainsaying that lack of physical access to financial access by way of not operating any bank account will impede the chances of any bankable group to access bank credit. Despite, the plethora of opportunities and competitive advantage of financial inclusion, the World Bank (2009) identified the difficulty faced by rural clients and most significantly the excluded that ordinarily and deliberately should complement the big clients in the role of capital accumulation for the purpose of raising investible funds needed in growing the economy. This study therefore, is interested in determining the impact of financial inclusion variables on economic growth of Nigeria as it sought to determine the relationship between financial inclusion and economic growth in Nigeria.

## **2. Literature Review**

### *The finance-growth theory*

The origin of the finance-growth hypothesis can be traced back to Bagehot (1873). The proponents of the finance-growth hypothesis argued that the existence of an energetic financial sector has growth-enhancing effects. Schumpeter (1911) posited that banks enable an economy to grow by providing efficient markets for funds. Goldsmith (1969), McKinnon (1973), Levine and Zervos (1996), Ndebbio (2004), among others, also emphasized the positive role of financial systems in economic growth. The finance-growth theory looked at the lack of access to finance as a critical factor responsible for persistent income inequality as well as slower growth. It posits that financial development creates a productive environment for growth through “supply leading” or “demand-following” effect. Consequently, access to safe, easy and affordable source of finance is recognized as a pre-condition for accelerating growth and reducing income disparities and poverty which in turn creates equal opportunities, enables economically and socially excluded people to integrate better into the economy and actively contribute to development and protect themselves against economic shocks (Serrao et. al, 2012). Furthermore, the main argument of proponents of the supply leading theory was that financial markets evolve in response to increased demands for financial services from an already budding economy and as such, the development of financial markets should be a reflection of growth in other sectors of the economy.

### *Empirical Literature*

Nkwede (2015) investigated the influence of financial inclusion on the growth of African economy, using Nigeria as a case study. Extrapolated time series financial inclusion data from Nigeria, covering the period of 1981 to 2013 were used in the analysis. The multiple regression models anchored on Ordinary Least Square technique was adopted in estimating the contributions of the variables. While controlling for other macroeconomic exogenous variables; the results indicated that deposit money banks loans to small scale enterprise and the deposit of rural bank branches of deposit money banks have significant negative influence on the growth of Nigerian economy, while the amount of loan of rural bank branches and the number of bank branches spread in the country had significant positive influence on the growth and development of Nigerian economy over the years. The study

therefore attributed the result to high level of financial exclusion of bankable adult citizens in Nigeria in particular and Africa in general. The study however suggested more inclusive financial system in Nigeria (and Africa) with focus on the rural populace because “growth is good, sustained high growth is better and sustained high growth with financial inclusiveness is the best of all” especially in the developing economy.

Nwankwo and Nwankwo (2014) examined the sustainability of financial inclusion to rural dwellers in Nigeria using cross-section survey design and descriptive analysis. The study found that the sustainability of financial inclusion to rural dwellers in Nigeria remained the mainstream for economic growth in any country. Moreover, it was also found by the study that the economy cannot grow fast without proper implementation of financial inclusion to rural areas in Nigeria. The study therefore recommended that the promotion of collaboration between DMBs, MFBs and communication services providers for enhanced intermediation of financial services should be encouraged; there is need to educate rural dwellers on the importance of banking as it would facilitate the success of CBN financial inclusion policy and that since some of the rural dwellers preferred to keep money under their pillows at home, there should be proper enlightenment to change their orientation on financial inclusion in Nigeria.

The studies of Jalilian and Kirkpatrick (2001) also provided evidence of the relationship between financial development and poverty reduction. They used data for a sample of 26 countries including 18 developing countries. The study used Bank Deposit Money Assets, and Net Foreign Assets as their measures of financial development. The results showed that a one percent change in financial development increases growth in the income of the poor in developing countries by almost 0.4 per cent- a significant impact.

Using rural bank branch data from India, which better capture the direct impact of access to financial services on poverty, Burgess and Pande (2003) studied the impact of rural banks branches on rural poverty reduction, and found that a one percent in the number of rural banked locations reduced rural poverty by 0.34%, and increased total output by 0.55% by facilitating diversification out of agriculture. Meanwhile, Munyanyi (2014) in a study of financial inclusion in Zimbabwe, using a cross sectional data drawn from a rural community found significant positive relationship between financial inclusion variables and incomes of rural dwellers. The result showed that there was an increase in access to financial services including access to credit.

In a study conducted by Mbutor and Uba (2013) on the impact of financial inclusion on monetary policy aggregates in Nigeria between the period 1980 – 2012, using standard econometric tool found a positive nexus between financial inclusion and monetary policy aggregates in Nigeria. The findings further indicated that improvement in financial access increased the effectiveness of financial policy.

Babajide et al. (2014) tried to ascertain the impact of flow of FDI on economic development of host African countries characterized with low income per capita. Panel data was utilized for 39 African countries, 20 of which were low income

countries. The results indicated that FDI had significant impact on economic development of host African countries, by enhancing development of host sector and reducing gradually dependence on foreign capital, which resulted in increased income per capita, better education, living standards and wellbeing of the host economies. The study however recommended that government of host economies should guide the sector of FDI inflow, and ensure policies are in place to enhance domestic investment and development in such sectors. This will gradually bring about closure of existing proactive factors and hence improve economic development.

Michael (2016) examined whether increased access to financial services by farmers can bring about sustainable development in Nigeria merits attention. In response, the study adopted survey research design to obtain and analyse the perception of 105 farmers in Ogun State, Nigeria on the subject. The study discovered that financial inclusion in the Nigerian agriculture sector can be used to achieve sustainable development. The study however recommended the citing of more financial institutions in rural areas and financial discipline, amongst others, as measures to achieve financial inclusion in the agricultural sector.

**3. Methodology**

*Research Design*

This study focused on the relationship between financial inclusion variables and economics growth in Nigeria from 2006 -2018. The study adopted *ex post facto* research design. Since economic theory variables already exist and their relationship is unknown, as such, data cannot be manipulated by the researcher to confess in a predetermined manner. The ex post facto fits well into this study because in time series all variables of interest are put under observation, their relationships and inter dependences examined as their outcomes are estimated. Also, their feedback effects are at the same time considered and empirically measured (Gujarati, 2003). The study relied on investigative explanation of dependent and explanatory variables. More so, the explanatory variables were researched on based on past records in other to seek the possible link, effects and variations that come from explanatory side which react on the dependent variable.

*Model Specification*

The model for this study is specified using Gross Domestic Product (GDP) as the dependent variable. While financial inclusion indicators such as access to Bank Credit (BKCR), number of Bank Branches (BKBR), Automated Teller Machines (ATM) and Point of Sales (POS) were used as independent variables (explanatory variables). Specifically, the model is specified in functional form as follows:

$$GDP = f(BKCR, BKBR, ATM, POS)..... 1$$

Equation (1) can be express in its econometric form as follows:

$$GDP = B_0 + B_1BKCR + B_2BKBR + B_3ATM + B_4POS + U_t..... 2$$

Where GDP refers to gross domestic product, BKCR is the bank credit, BKBR indicates bank branches, ATM is Automated Teller Machine, POS signifies point



of sales,  $U_t$  is the stochastic error term,  $B_0$  stands for constant term, while  $B_1$  and  $B_2$  is the slop of the coefficients.

*Data Discussion*

The variables used in this study include gross domestic product (GDP), access to credit, POS, and bank branches and ATM. The GDP is used as proxy for economic growth and measured total output of goods and services produced annually. Thus, the GDP is output measure of a country for the period under study. Also, the data for commercial bank access was measured by calculating the total money credit by all customers of all the banks guaranteed by the central bank of Nigeria taken annually for the period of 15 years whereas the Point of Sale (POS) is the total number of POS used annually for the period of the study; the number of ATM was also measured to provide the data for bank branches.

*Sources of Data Employed*

The data study made use of secondary data. The data for gross domestic product (GDP), access to credit, POS, and bank branches and ATM .were culled from World Bank Statistical data and Central Bank of Nigeria (CBN) statistical Bulletin of 2018

**4. Result**

The result obtained from the estimation of the impact financial inclusion variables on economic growth of Nigeria are presented thus.

*Descriptive Statistics of Data*

Table 1: *Summary Statistics of Time Series Variables of the Study*

	GDP	BKCR	BKBR	ATM	POS
Mean	5.098065	13.65978	5.290998	10.56515	16.172951
Median	6.309719	14.15507	5.209569	11.49132	21.00673
Maximum	9.250558	22.26722	6.563825	16.92304	63.715203
Minimum	-1.616869	8.111026	3.780877	0.680087	15.41700
Std. Dev.	3.086716	4.086368	0.925192	5.926912	23.159514
Skewness	-0.827870	0.575512	-0.032982	-0.589595	1.130421
Kurtosis	2.672037	2.907425	1.649912	1.933173	2.671814
Jarque-Bera	1.780648	0.833392	1.141930	1.580380	3.261947
Probability	0.410523	0.659221	0.564980	0.453759	0.195739
Sum	76.47098	204.8966	79.36496	158.4773	2.43E+08
Sum Sq. Dev.	133.3894	233.7777	11.98373	491.7961	7.51E+15
Observations	15	15	15	15	15

*Source: Author's Computation*

Table 1 above shows the summary statistics of Gross Domestic Product (GDP), Bank Credit (BKCR), Bank Branches (BKBR), Automated Teller Machines (ATM) and Point of Sales (POS). The results disclosed that average score of economic growth is 5.1% whereas, Bank Credit (BKCR), Bank Branches (BKBR), Automated Teller Machines (ATM) and Point of Sales (POS) have an average score of 13.7, 5.3, 10.6 and 16%, respectively. The result further disclosed that the

probability values of the Jarque–Bera statistic was statistically significant, indicating that all the data used in the study are normally distributed.

*Unit Root Test Result*

The Augmented Dickey Fuller (ADF) unit root test is used in order to test for the order of integration of the time series used in the study. This step is necessary because the ARDL bounds test used in the study requires the variables of the study to be stationary at level and first difference and none of the variables should be stationary at second difference. At this point, the unit root test result of the time series data used in the study are presented in table 2 as thus.

Table 2: Unit Root Test

Series	ADF t-Statistic	ADF	5% critical level	Order of integration
GDP	-4.456478		-3.1449**	I(1)
ATM	-10.1267		-3.8209**	I(0)
BKBR	-4.9012		-3.8753**	I(1)
BKCR	-5.8876		-3.9336**	I(1)
POS	-3.8809		-3.8299**	I(0)

*Note: \*significant at 1%, \*\* significant at 5%, \*\*\* significant at 10%*

*Source: Author's Computation*

From the result presented in table 2, the unit root status of the variables indicate that POS and ATM were stationary at level I(0) whereas GDP, BKBR and BKCR were stationary at first difference I(1). In other words, the series possesses a mixture of order of integrations, which implies that the variables were stationary at level and first difference and it is a strong reason for adopting ARDL model in the study.

Table 3: Lag Structure

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-246.9864	NA	874.4423	12.44932	12.53376	12.47985
1	-211.4227	65.79287*	180.5386*	10.87113*	11.12447*	10.96273*
2	-210.6339	1.380439	212.4205	11.03169	11.45391	11.18435
3	-208.5331	3.466186	234.6706	11.12666	11.71776	11.34038

*Source: Author's Computation*

The lag was automatically selected from Table 3, where all the lag selection criteria choose one period lag for the estimation of the ARDL model.

Table 4: Bound Test Results

F-statistics	Lag		Critical Values	
	1	Sig level	lower bound I(0)	upper bound I(1)
71.88		10%	3.03	4.06
		5%	3.47	4.57
		1%	4.4	5.72

*Source: Author's Computation*

The rule of thumb for accepting and rejecting null hypothesis in Bound test states that if the value of F-statistic is greater than the value of the upper bound value,

then null hypothesis is rejected which implies that , the presence of long run relationship of the variables of the study.

Therefore, the result in table 4 shows that the calculated F-statistics is 71.88 while the upper critical bound is 4.57. Thus, the null hypothesis (Ho) of no co-integration is rejected. This implies that there is long-run relationship between financial inclusion variables and economic growth which is suitable for long run policy forecast.

Table 5: Estimated long-run parameters using ARDL Technique

Variable	Coefficient	Std. Error	t-Statistic	Prob.
POS	0.000000	0.000000	8.299855	0.0763
BKCR	0.066499	0.011189	-5.943363	0.1061
BKBR	0.160483	0.009435	17.009214	0.0374
ATM	0.378281	0.019885	19.023230	0.0334
C	-0.204340	0.031838	-6.418059	0.0984
@TREND	0.036137	0.002522	14.328866	0.0444

$R^2 = 0.99$ ,  $Dw = 2.25$  2.0,  $F(Prob) = (0.006)$

*Source: Author's Computation*

From the ARDL long run estimated results obtained, holding all the other factors constant, the GDP growth is accounted by 99% of the change in financial inclusion variables. The result also indicates that though POS had positive sign, it has no economic value on Nigeria's economic growth at the time of the study. Also, one billion naira increase of commercial bank credit resulted to increase in the country's GDP by about 6 billion naira. Holding other factors constant, the growth of bank branches in Nigeria by one unit resulted to increase in GDP by about 16 units. The obtained regression equation further implied that there is a strong positive relationship between GDP growth and growth of Branch Networks. Furthermore, a unit increase in the number of automated teller machine users resulted to increase in GDP by about 37 units. This implied that the number of ATM users had the highest influence on the GDP growth followed by Number of Branch Networks then commercial bank credits. There is a weak positive relationship between Point Of Sale (POS).and GDP growth The criteria for comparing whether the predictor variables were significant in the model was through comparing the corresponding probability value obtained and  $\alpha=0.05$ . If the probability value is less than 0.05 then the predictor variable is significant and if otherwise, it is not significant. From the result presented, all the financial inclusion variables (Number of Mobile Money users/Accounts, Bank credit, Branch networks and Automated Teller Machines) under consideration in this study were significant except Point of Sale (POS) that manifested p-value of (0.0763) which is greater than (0.05) level of significance. The F-statistics of (162.58) with a p-value of (0.006) less than (0.05) indicated that the variables of financial inclusion had significant joint influence on Nigeria's GDP growth.

Diagonistic Tests of Validity of Result

Test of Stability

The result presented below shows the stability of the coefficients, the graph of the cumulative sum of recursive residual (CUSUM). The residuals are plotted within 5% critical bounds.

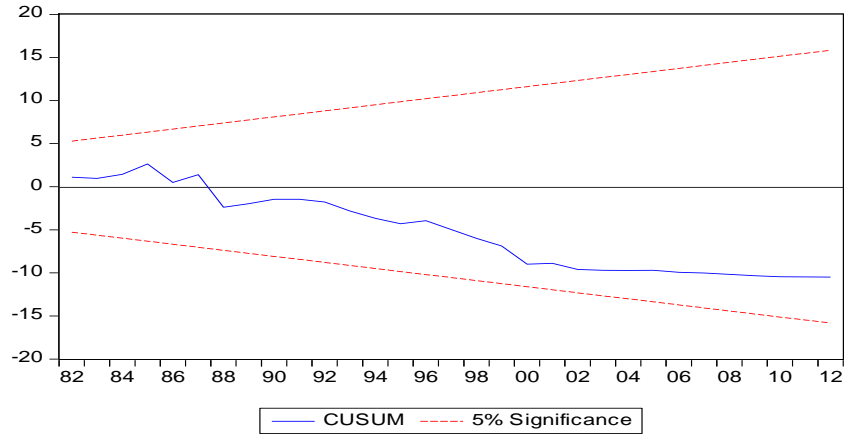
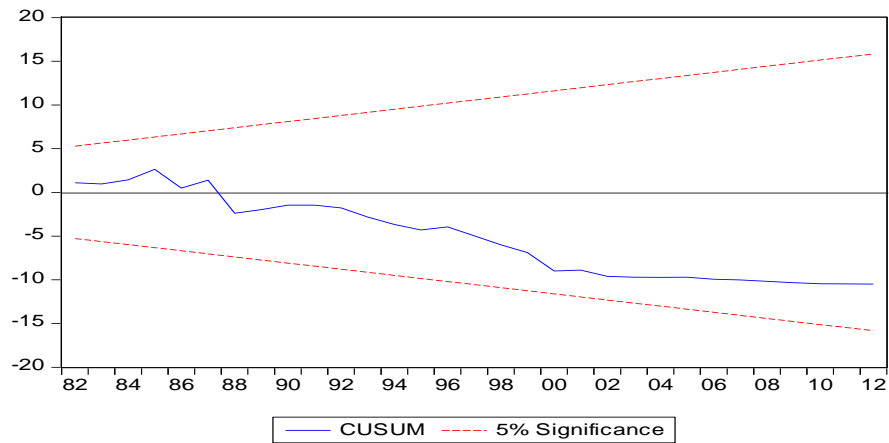


Figure 1: Graph of CUSUM Test

The two straight red lines represent the critical bounds at 5% significance

Graph of cumulative sum of Squares of Recursive Residuals (CUSUMS)



The straight line represents critical bounds at 5% significance levels (cusumsq) on the graph of test of stability. From the findings the regression specification and estimation were significant having passed all diagnostic tests.(CUSUMSQ) stability tests were shown. Since the estimated model is stable over the study period the line then lies between the critical points.

Another stage is to check the goodness of fit and the validity of the model. Diagnostic tests such as Lagrangian multiplier (LM) test for serial correlation and the plot of cumulative sum of recursive residues (CUSUM) and cumulative sum of squares of recursive residuals (Cumusq) stability test.

#### *Serial correlation*

The null hypothesis of no serial correlation was not rejected. This implies that there is evidence of not serial correlation since P-value of F-statistic of 0.095 is 0.90 which is greater than 0.05. The goodness of fit of the model is relatively high.

#### *Discussion of Result*

Discussions were made in line with the results obtained from the data analysis used for the study. At this point the overview of the descriptive statistics of the data used in the study indicated that all the variables used for the study were normally distributed. The preliminary investigation on the stationarity of the variables used for the study using Augmented Dickey Fuller test revealed gross domestic product, access to bank branches and bank credit availability were integrated at first difference whereas automated teller machine and point of sales were integrated at level, thereby showing a mixed order of integration of one and zero which gives the researcher a good reason for adopting ARDL – Bound test.

Furthermore, the ARDL result obtained indicates that there existed a long-run relationship between financial exclusion variables and economic growth of Nigeria. The result is in conformity with finance led theory of Bagehot (1873) and inclusive growth theory that the existence of financial sector combined with inclusive growth strategy generates growth enhancing effects.

Moreover, the results of the estimated long run coefficients of the variables used in the study disclosed that, the availability of bank branches and automated teller machines respectively were statistically significant and contributed positively to the growth of economic growth in Nigeria. Whereas the amount of transactions using point of sales shows no economic value to the contribution of economic growth in Nigeria under the periods of the study, while availability of bank credit has not been utilized and therefore, has no statistically significant effects on the economic growth in Nigeria; but not withstanding and holding all other factors constant, the result generally revealed that economic growth is attributed to 99% changes in financial inclusion variables in Nigeria.

The post-diagnostic result conducted on the above regression result revealed that the regression model employed for the study was free from autocorrelation, heteroskedasticity and that the residuals of the model were normally distributed.

#### *Long-run Impact of Financial Inclusion on the Economic Growth in Nigeria*

The long run result of bank branches presented in table 5 above revealed that availability of bank branches has a positive and significant impact on economic growth in Nigeria at the long run. The result disclosed that one percent increase in bank branches leads to 16% increase in economic growth in Nigeria. The result shows that there is a positive relationship existing between the number of available bank branches and economic growth in Nigeria at the period of the study. It implies

that an increase in bank branches will lead to an increase in economic growth in Nigeria, all other factors held constant. On the other hand, it means that financial access to all has the potency of boosting Nigeria's economy. This result is validated by the findings of Kama and Adigun (2013) and Stephen, Flora and Louise (2009) that a long run relationship existed between financial inclusion variables and economic growth in Nigeria.

These findings were consistent with the findings of Ngugi, Amanja and Maana (2010) who established that the financial sector plays a crucial role in economic development. The depth of the financial sector has generally promoted economic growth in Nigeria.

The study also established that there is a strong positive relationship between economic growth and ATM which is one of the variables of financial access. The result shows that a one percent increase in ATM will lead to a 37% increase in economic growth in Nigeria, holding all other things constant. These findings were consistent with those of Mbutor and Uba (2013) who found that there was evidence of the effect of financial inclusion proxies on economic growth in Nigeria.

Furthermore, the study found that access to credit impacted insignificantly on economic growth whereas the amount of POS usage has no economic value on the economic growth in Nigeria under the periods of the study.

#### **5. Conclusion and Recommendation**

This study estimates the impact of financial inclusion variables on Nigeria's economic growth. The result indicated a mixed order of integration and existence of long-run relationship existing between financial inclusion variables and economic growth. Furthermore, the ARDL estimation was conducted to obtain the long and short run coefficients of the variables under consideration. On the basis of the result obtained, it is concluded that the components of financial inclusion have a significant contribution to GDP growth in Nigeria.

In the light of the results and findings in this paper and in reference to the objectives of the study and estimated result of the model, the following recommendations are; since the size of bank credit is significant in raising domestic output of Nigeria and its access has increased following an increase in financial inclusion then, the Central Bank of Nigeria should encourage the commercial banks to raise their credit creating abilities.

Since the coefficient for POS is positive and significantly related to output growth of Nigeria, it shows that an increase in the number of POS in the country will propel and facilitate banking transactions. This is evident given the size of bank customers that crowd our banking halls daily and the long queues at the ATM dispensing centers. Therefore, the commercial banks should increase the supply of POS agents by reducing the stringent conditions attached to POS subscription.

Lastly, it is evident that the spread of branch networks of banks in Nigeria impedes financial access of the bankable adults therefore it is exigent for banks to expand their operations especially the rural communities who have been financially excluded.

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## **Do Energy Consumption, Interest Rate and Import affect Household Consumption in Nigeria: What did the Empirical Evidence says?**

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### **Abstract**

*The aim of the paper is to find out the effects of changes in energy consumption, interest rate and import on household consumption in Nigeria. Nigeria has diverse population of over 200 million people. About 70% of the Nigerian population is classified as poor; hence, spend most of their income on consumption of necessities of life. The paper uses log linear regression model and generalized method of moments (GMM) for its analysis. Data was collected for the period ranging from 1985 to 2018. The result of the study shows that interest rate and energy consumption affect household consumption, while import is not statistically significant. This result has important implication for the Nigerian economy. A statistically significant relationship between interest rate and household consumption means that monetary authorities can boost household consumption by lowering the interest rate. The positive and statistically significant relationship between energy consumption and household consumption is expected a priori. It is expected that higher level of household consumption will lead to higher level of energy consumption. The major recommendations of the paper are two: reduction in interest rate and constant supply of energy to boost household consumption which in turn boosts demand for goods and services.*

**Keywords:** Household-consumption, Energy, Interest-rate, Import, Foreign-Exchange

**JEL Classification:** E2, E4, F4, Q4

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### **1. Introduction**

In economics, consumption is one of the fundamental components of Gross National Product and a major variable for measuring economic growth. Consumption expenditure and the nature of consumption function have engaged much of the macroeconomic debate in the last century. According to Branson (1989), consumption expenditure accounts for about 2/3 of aggregate expenditure in virtually all economies. Aggregate consumption expenditure includes expenditure on durable and non-durable goods. But, consumption in itself is influenced by a number of factors both at micro and macro levels. Factors such as income, taste and culture were found to be the determining factors in influencing

consumption at micro level. Factors such as interest, GDP, foreign exchange and inflation were found to affect consumption at the macro level. One other factor that play a significant role in determining consumption at the macro level and whose contribution tend to be under emphasis is energy. Energy is very important for the good running of any modern economy. Modern firms and household relies on energy for day to day functions. Thus, energy economics is very important for the study of today economies. Increase in energy consumption is a pointer to increase economic activities, and an improvement in economic development of energy signifies that a country has high economic ranking. In modern economies, electricity is indispensable for certain basic household activities, such as lighting, refrigeration and the running of household appliances, and cannot easily be replaced by other forms of energy (IEA, 2002). Other important sources of domestic energy in Nigeria include liquefied natural gas, biomass, kerosene, charcoal and firewood. All these have various influences on domestic energy consumption, depending on the economic fortune of the household. Because Nigeria is a poor lower middle income country, energy consumption per capita is low. Nigeria faces the problem of electricity supply, but despite that the price of petroleum in Nigeria is one of the cheapest in the world. Majority of the poor Nigerians make use of kerosene, charcoal and firewood as the main source of their domestic energy. In a study by Abd'razack, *et al.* (2012) on household energy consumption in Niger state Nigeria, its finding shows that due to increasing price of kerosene, electricity and liquefied natural gas products in Minna, Niger State capital, households shifted their domestic energy use to biomass.

In oil producing countries like Nigeria, anytime there is an oil price increase, the income generated by the price increase gives the oil producer additional income and wealth effects. If these effects are transferred to the domestic economy, it will boost investment among agents and firms. In turn, unemployment should decrease and thereby let households consume more. Increase or decrease in interest rate in an economy also has similar effects on the economy, boosting or reducing household consumption in the process. The world itself is a global village. Globalisation has made it difficult for any country to consider its own internal working of its economy in isolation from the rest of the world. In this connection, inflation and other negative forces can be imported from abroad into the domestic economy. Thus, imported consumer goods and services can have a lot of effects on domestic household welfare. At the same time cheaper imported goods and services from abroad can influence household positively by reducing the costs of their purchases, living them with extra pocket money. But, at the same time it does this it also results in the loss of source of livelihood for the households who work in the sector that is destroyed by importation of products. Studies like that of Atkin, Faber and Gonzalez-Navarro (2015) have argued that global retail chains based in developing countries are causing a radical transformation in the way households consume. They noted that foreign retail firms cause large and significant welfare gains for the average household that are mainly driven by a reduction in the cost of living. According to their findings, about one quarter of this price index effect is due to pro-competitive effects on the prices charged by domestic stores, with the remaining three quarters due to the direct consumer gains from shopping at the new

foreign stores. This impact of globalisation on domestic consumers is by way of foreign direct investment (FDI); many other ways exist by which the world affects what and how a household located in Nigeria can be affected by what is going elsewhere around the world. The main aim of this paper is to empirically test how households in Nigeria are affected by changes in foreign exchange, interest rate and energy supply. The paper is divided into introduction, literature review, methodology, analysis of results and conclusion.

## **2. Literature Review**

Economists such as Milton Friedman, Modigliani, John M. Keynes and Duesenberry were fascinated with finding out the factors that determined consumption. They studied factors such as income, wealth, interest rate, capital gain, liquid assets and psychological factors that can influence consumption. Interest rate plays an important role in influencing consumption. Understanding the impact of interest rate on consumption is thus important. It is hypothesized that variations in interest rate would result in variations in consumption. Under Irving Fisher's Intertemporal Choice hypothesis, consumption depends on interest because of the need to borrow between periods of time in order to balance consumption when there is shortfall in income. Economists have decomposed the impact of an increase in the real interest rate on consumption into two effects: an income effect and a substitution effect (Mankiw, 2007). The income effect tends to make the consumer want more consumption in both periods (current and future periods). While the substitution effect tends to make the consumer choose more consumption in future period and less consumption in current period. Thus, an increase in the real interest rate raises future-period consumption. Economists such as Mankiw (1981), Hansen and Singleton (1983) and Hall (1988) have examined how consumption responds to changes in real interest rate. Their findings show that change in consumption relatively do little to change in real interest rate. Raut and Virmani (1989) found positive relationship between the real interest rate and consumption in a study on developing countries.

Various scholars have described the way policy-induced changes in the nominal money stock or the short-term nominal interest rate impact real variables such as aggregate output, consumption and employment. Mishkin (1995) has identified four channels of monetary transmission, which are interest rate, credit, exchange rate and Assets Price effects. The interest rate channel of monetary policy transmission is the standard Keynesian channel of monetary transmission (Mishkin, 1995). A contractionary monetary policy leads to a rise in real interest rate, which in turn raises the cost of capital; thereby causing a decline in investment spending. This process also leads to a decline in aggregate demand and eventually a fall in output. A higher real long-term interest rate leads to a decline in real investment, real consumption, and thereby on real GDP. Low level of inflation is key to the effectiveness of monetary transmission. The exchange Rate channel of transmission works through the aggregate demand as well as the aggregate supply effects which is more effective under the flexible exchange rate regime. A contractionary monetary policy, led to increase in interest rate (real) which in turn led to increase in exchange rate, that action led to decrease in net export and finally a fall in

output. A possible channel through an oil price increase affect households through domestic fuel prices. Increase in fuel prices decrease household's disposable income leading to reduce expenditure on consumption. If the effects of the increase are long-lasting, the effect would affect unemployment and lead to changes in industries production structures. In turn, this leads to labor and capital reallocations and changes the unemployment level due to layoff or hiring (Boman, 2018). Hickman *et al.* (1987) describe transmission channel through the "terms of trade" mechanism. According to this, an oil price increase would lead to an income transfer between importing countries and exporting countries. For the importing countries, the effects would lead to reduced spending and lower aggregated demand in the domestic economy. That resulted in inflationary pressure due to effects on production industry leading the central bank to tighten monetary policy. This further resulted in reduce households demand for goods and services. For the exporting country like Nigeria, the additional revenues from an increase in oil-prices could overturn the negative effect from lower global demand and stimulate the domestic economy.

Using modified consumer spending model and data that span the period of 1981–2011, Manasseh, Abada and Ogbuabor (2018) examines the effects of interest and inflation rates on consumer spending. The study extended its investigation into the causal relationship between consumer spending, interest and inflation rates using granger causality Wald test. The effect of inflation which was measured with CPI on consumer spending is found to be statistically significant, while Interest is insignificant. The outcome of the granger causality using Wald test shows that future interest and inflation rates cannot be predicted using PCE. Adedeji and Adegboye (2013) examined the factors that determine the private consumption spending in Nigeria, using an Error Correction Mechanism (ECM) after testing for the stationarity of the data, the study revealed that except for real interest rate in current year which was not statistically significant in all experimental runs, all other explanatory variables were statistically significant. The old-age dependency ratio, inflation rate, gross domestic product (GDP) per capita and disposable income have significantly positive effect on private consumption spending, while real GDP growth, foreign direct investment, public spending and change in real effective exchange rate had negative impact. Ishioro (2013) study examines the channels of monetary transmission mechanism in Nigeria. The study concludes that three channels are functional in Nigeria: the interest rate, exchange rate and the credit channels.

Tule and Osude (2014) investigated the relationship between oil price and real exchange rate movement in Nigeria. Using monthly data covering the period 2000 to 2013, this study employs GARCH process to test the relationship between oil price and exchange rate volatility. The results suggest the persistence of volatility between real oil prices and the real exchange rate. They conclude that oil price fluctuations lead exchange rates movement in Nigeria. Englama, Oputa, Sanni, Yakub, Adesanya and Sani (2013) estimate the aggregate import demand function for Nigeria using quarterly data covering the period 1970 to 2011. The study found that the coefficients of external reserves, domestic consumer prices, level of income

and exchange rate were all statistically significant, suggesting that these variables were important factors determining the level of imports in Nigeria. Muse (2014) examined the causal relationship between economic growth and energy consumption in Nigeria during period 1980-2012. The cointegration test result revealed that there was a long run relationship among the variable. The study found that electricity is an important factor in economic growth in Nigeria. The result is thus an indication that energy consumption enhances economic growth. Bassey and Ekong (2019) investigated the dynamic relationship between energy consumption and inflation in Nigeria using data for the period 1980 to 2017. Applying Autoregressive Distributed Lag (ADL) technique, the study found that Premium Motor Spirit (PMS), Dual Purpose Kerosene (DPK) and Natural gas were noninflationary. Also, Automotive Gas Oil (AGO) consumption produces strong evidence of positive inflationary pressure. They found a strong causality between natural gas consumption and inflation. Rehman (2014) has examined the relationship between energy consumption monetary policy and inflation in five Asian countries in the years following the global financial crisis using Granger causality; the results showed evidence of strong interaction between oil consumption and inflation for at least two Asian countries. The study argued that if there are high oil prices in the international market, the domestic inflation in these two countries is likely to be the oil price push inflation.

**3. Methodology**

The paper used Log Linear regression and generalized method of moments (GMM) models for the analysis of the data for the study. A log-linear model is a mathematical model that takes the form of a function whose logarithm equals a linear combination of the parameters of the model, which makes it possible to apply (possibly multivariate) linear regression (Gujarati and Porter, 2009). It has the general form.

$$\exp(c + \sum_i W_i f_i(X)) \dots\dots\dots 1$$

Where,  $f_i(X)$  is quantities that are functions of the variable X, as well as  $c$  and  $w_i$  are the model parameters

The GMM estimators are known to be consistent, asymptotically normal, and efficient in the class of all estimators that do not use any extra information aside from that contained in the moment conditions. GMM were championed by Lars Peter Hansen in 1982 as a generalization of the method of moments. The Generalized Method of Moments (GMM) is a generic method for estimating parameters in statistical models. The GMM method then minimizes a certain norm of the sample averages of the moment conditions. Thus, the GMM estimator can be written as:

$$\hat{\theta} = \arg \min \left( \frac{1}{T} \sum_{t=1}^T g(Y_t, \theta) \right)^T \hat{W} \left( \frac{1}{T} \sum_{t=1}^T g(Y_t, \theta) \right) \dots\dots\dots 2$$

Data for the study was collected from Nigerian Bureau of Statistics and World Bank for the period 1985 to 2018. For the variables used for the study, monetary

policy rate of the CBN is used as proxy for interest rate; and total final energy consumption is used as proxy for energy consumption. For the household consumption variable, we used the household consumption data generated by national bureau of statistics. Household has been defined as group of more than one individual (though, it can consist of one individual) that foster economic and social relationship between its members and maintain mutual relationship with the wider economy and society (Mattila-Wiro, 1999). Household consumption refers to the use of goods and services to satisfy the needs of the household. Scholars such as Gary Becker put family at the centre of their household theory (Mattila-Wiro, 1999). In the case of exchange rate, we attempt to capture how households react to changes in price of foreign goods by including exchange rate of Naira to dollar. Exchange rate serves as proxy for import. When exchange rate falls, consumption expenditure on imported products falls, because Naira loses value (depreciates). As a result, more Naira would be needed to buy a dollar unit of foreign goods; hence, causing an inverse relationship between exchange rate and consumption of import.

*Specifications and Expectations of the model*

To capture the determinants of household consumption in Nigeria, our model is specified as follows:

$$HC = f(INT, EC, EXR) \dots\dots\dots 3$$

Where HC is Household Consumption, INT refers to Interest Rate, EC indicates Energy Consumption, and EXR represents Foreign Exchange Rate.

The log linear form of the model is:

$$\ln HC = \beta_0 + \beta_1 \ln INT_1 + \beta_2 \ln EC_2 + \beta_3 \ln EXR_3 + \varepsilon \dots\dots\dots 4$$

Where, ln represents log transformation,  $\beta$  is the parameters and  $\varepsilon$  stands for error term.

**4. Results**

*Log Linear Regression Result*

The result of the log linear regression shows that household consumption is affected by changes in interest rate and energy consumption. However, it is not affected by changes in foreign exchange. The result of the analysis shows that interest rate and energy consumption are statistically significant while foreign exchange is not statistically significant. The result also shows that while the relationship between household consumption and interest is negative, the relationship between household consumption and energy consumption is positive. This means that increase in interest rate lead to reduction in consumption while reduction in interest rate leads to increase in consumption. For the energy consumption, the positive relationship means that increase in energy consumption is associated with increase in household consumption. Base on their respective coefficients, it means that 1% increase in interest rate leads to 0.229% decrease in household consumption; while 1% increase in energy consumption leads to 1.696% increase in household consumption.

Table 1: Log Linear Regression Results

Variable	Coefficient	Statistical Level (P.Value)
LOG(INT)	-0.2292	0.0207
LOG(EC)	1.6958	0.0000
LOG(EXR)	0.0098	0.8047

Source: Authors' Computation

#### GMM Result

The result from GMM analysis show close statistical significance level for the variables in the study, as it was found in the case of log linear regression analysis. See appendix section for details about the tests results.

Table 2: GMM Results

Variable	Coefficient	Statistical Level (P.Value)
INT	-5.45	0.0060
EC	4.43	0.0000
EXR	-1.49	0.5432

Source: Authors' Computation

### 5. Conclusion and Recommendation

The aim of this paper is to find out the effects of changes in energy consumption, interest rate and import (represented by foreign exchange) on household consumption in Nigeria. Nigeria has diverse population of over 200 million people. About 70% of the Nigerian population is classified as poor; hence, spend most of their income on consumption of necessities of life. Per capital income in Nigeria is put at \$2,222 in 2019. It is under this circumstance that we tried to find out the effects of energy, interest rate and import on household consumption in Nigeria. The result of the study shows that interest rate and energy consumption affect household consumption, while import is not statistically significant. This result has important implication for the Nigerian economy. A statistically significant relationship between interest rate and household consumption means that monetary authority can boost household consumption by lowering the interest rate. This alone has a lot of repercussions; because higher consumption means higher market for domestically produce goods and services, which also mean more employment for citizens. More consumption by household also means more tax for government in form of consumption tax, income tax (as more people get job), and industrial taxes. For economy in recession and facing economic collapse, this is the thoughtful measure to take. The positive and statistically significant relationship between energy consumption and household consumption is expected. It is expected that higher level of household consumption will lead to higher level of energy consumption. Looking at the benefits of higher consumption in a depressing economy we have mentioned here, Nigerian government should make energy affordable and available to Nigerians in order to facilitate higher level of consumption. Various sources of energy such as electricity, fuel, renewable energy should be encouraged. Without constant supply of energy Nigerian economic development is not realizable. Thus, the major recommendations of this paper are

two which are: reduction in interest rate and constant supply of energy to boost household consumption which in turn boosts demand for goods and services.

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## Electricity production, Economic Growth and Environmental Quality in Nigeria

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### Abstract

*The objective of this study is to investigate the impact of electricity production and economic growth on environmental quality in Nigeria. The study used the Autoregressive Distributed Lags (ARDL) Model for the period of 1980-2015. The study established the existence of long run association among the variables. It further revealed that in the long run, electricity production and economic growth positively influence environmental quality in Nigeria. Therefore, the study recommends policies that will enhance clean energy production in Nigeria.*

**Keywords:** CO<sub>2</sub> Emissions, Electricity Production, Economic Growth, Autoregressive Distributed Lag

**JEL Classification:** P28, Q43, Q47

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### 1. Introduction

The persistent rise in the global discharges of CO<sub>2</sub> emissions and the likely undesirable consequences of this practice on the global atmosphere attracts the attention of policy makers at an international level to debate on the contribution of various countries to the total emissions and the efforts put forward by these countries to contract these emissions (Kojima and Bacon, 2009). The global CO<sub>2</sub> emissions had risen from about 21bn tons in 1990 to about 29.4bn in 2008, representing about 40 % increase over the same period (Tang and Tan, 2014). Moreover, it is argued that if necessary action is not taken to cut down the concentration of CO<sub>2</sub> emissions in the atmosphere, by the year 2035, it will be two times its amount from its pre-industrial level which may cause a short run increase in the global average temperature by more than 2oC and a higher probability of rising such temperature by more than 5oC in the long run (Tiwari, 2011). That is

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why most of the developed industrialized nations have committed to cut down their CO<sub>2</sub> emissions significantly by the year 2020 (Kojima and Bacon, 2009).

Similarly, as most of the developing nation's keep growing, their emissions of CO<sub>2</sub> become one of the most important concerns in various agreements at international level especially concerning the ingress of Foreign Direct Investment (FDI) and the environmental quality. In handling the issue of CO<sub>2</sub> emissions, the mottos of "green economy" and "low carbon city" are presently popular among the developing nations (Tang & Tan, 2014). Therefore, many developing nations are expected to control the growth of their CO<sub>2</sub> emissions in the near future (Kojima & Bacon, 2009).

Many factors responsible for the growth of CO<sub>2</sub> emissions worldwide include: population and economic growth, industrialization and FDI operations, and energy production and consumption (Black et al., 2015; Qader, 2009). The extent to which each of these factors contributes to CO<sub>2</sub> emissions in the atmosphere varies from one region to another depending on the extent of the existence of these factors in a country. The process of understanding how these factors influence the concentration of CO<sub>2</sub> emissions is vital for necessary environmental policy making. Though, many previous studies were conducted to examine the determinants of CO<sub>2</sub> emissions in many countries, most of these studies (Danlami et al., 2017; Begum et al., 2015; Razak et al., 2013) concentrated mostly on the relationship between energy consumption, economic growth, population and CO<sub>2</sub> emissions without considering the simultaneous impacts of energy production, capital formation and FDI on CO<sub>2</sub> emissions.

Furthermore, Nigeria was once seen as one of the fast growing economies in the world and the largest economy in Africa (World Bank, 2015). This may have impact on the environmental quality. In addition the Nigerian Meteorological Agency (2012) data has shown that the average annual rainfall and temperature have been fluctuating and this cannot be unconnected to economic activities in the country.

Meanwhile, most of the studies on CO<sub>2</sub> emissions concentrated mainly on one country as the focus of analysis. For instance, Tang and Tan (2014) focus only on Vietnam, Nnaji et al. (2013) on Nigeria, and Rui and Shuang (2011) on Shandong province. Therefore, based on the above argument, the contribution of this study is that it tries to assess the simultaneous impacts of factors, such as electricity production, GDP, and FDI on CO<sub>2</sub> emissions in Nigeria. The findings of this study therefore, are expected to provide new avenues to policy makers in designing a comprehensive environmental policy in Nigeria. The paper will be presented as follows: Section 2 provides the review of related literature, method of analysis is contained in Section 3. Section 4 provides the estimated results. Finally, Section 5 provides the policy implications and concludes the study.

## **2. Review of Literature**

The relationship among energy consumption, CO<sub>2</sub> emissions and economic growth can be categorized into three groups of research in the literature. The first group of research paid attention to CO<sub>2</sub> emission-growth nexus which attempt to validating

the EKC hypothesis, example of such studies are De Bruyn, Van Den Bergh, and Opschoor (1998), Halkos (2003), Jalil and Mahmud (2009), Fodha and Zaghoud (2010), Narayan and Narayan (2010), Saboori, Sulaiman and Mohd (2012), Liu, Yan and Zhou (2016). The second group of research, for instance, Stern and Cleveland (2004), Soytas and Sari (2009), Ozturk (2010), Ouedraogo (2013), Danmaraya and Hassan (2016) and Solarin and Ozturk (2016) concentrate on energy-growth nexus where issues of energy consumption are related to economic growth. The third group of research such as: Soytas and Sari (2009), Al-mulali and Sab (2012), Govindaraju and Tang (2013), Salahuddin and Gow (2014) and Tang and Tan (2015) attempt at merging the  $CO_2$  emissions-growth nexus with energy-growth nexus. In this case, the dynamic relationship among energy consumption,  $CO_2$  emissions and economic growth are analyzed.

The relationship between environmental pollution and economic growth starts with the study of Grossman and Krueger(1991) for North America, which demonstrated that in the initial stage, environmental quality tend to deteriorate as per capital GDP increase, but later improve with further increase in GDP per capita. This brought about the EKC hypothesis, which suggests an inverted U-shaped relationship between environmental pollution and economic growth. Since then, many studies concentrate on the EKC hypothesis with diverse findings. For instance, Saboori, Sulaiman, and Mohd (2012) investigate the EKC hypothesis for Malaysia and found a U-shaped relationship between  $CO_2$  emissions and economic growth, implying that  $CO_2$  emissions fall with increase in income. Furthermore, an inverted U-shaped relationship among economic growth and  $CO_2$  emissions was established in the studies of Halkos (2003) for OECD and non-OECD countries, Jalil and Mahmud (2009) for China, Pao and Tsai (2010) for BRIC countries, Heidari, Turan Katircioğlu, and Saeidpour(2015) for Association of South East Asian Nations, Tang and Tan (2015) for Vietnam, Bento and Moutinho (2016) for Italy, among others. Yet, some studies such as De Bruyn, Van Den Bergh, and Opschoor (1998) and Begum, Sohag, Abdullah and Jaafar (2015) asserted that the EKC hypothesis cannot hold and hence the EKC is invalid in explaining  $CO_2$  emissions and economic growth.

Taking the instance of Sohag, Abdullah and Jaafar (2015), their study investigates the dynamic impact of GDP growth, energy consumption and population growth on  $CO_2$  emissions in Malaysia covering the period between 1970-2009 using the ARDL bound testing approach. Their study failed to validate the EKC hypothesis, meaning that the relationship between the variables did not justify the inverted U-shaped. Contrary to this finding, Sharif, Afshan, Chrea and Khan (2020) analyzed the EKC hypothesis in Malaysia using data covering 1995Q1 to 2018Q4 by employing the QARDL model and established the presence of the inverted U-Shaped curve in the Malaysian economy. Further, Saqib and Benhmad (2020) study the EKC hypothesis by investigating the relationship between ecological footprint, economic growth, energy consumption and growth for EU countries covering the period of 1995 to 2015 and found that income growth support the validity of EKC hypothesis.

Similarly, the relationship connecting energy consumption with economic growth start with the study of Kraft and Kraft (1978) and since then, a lot of studies have attempt at investigating the energy-growth relationship with contradicting findings. While some studies, such as: Apergis and Payne (2010), Odhiambo (2014), Iyke (2015) and Tang, Tan and Ozturk (2016) argued in favor of unidirectional causality running from energy consumption to economic, other studies, for example, Ouedrago (2013), Stern and Enflo (2013) and Ahmed and Azam (2016) argued that economic growth granger causes energy consumption. Also, in the third category, bidirectional causality was found between energy consumption and economic growth. In this case, there is a feedback relationship between energy consumption and economic growth (see for example: Ziramba, 2009, Rahman et. al, 2015, & Solarin & Ozturk, 2016). The last categories are of the view that there is no causal relationship between energy consumption and economic growth. they are otherwise referred to as the neutrality hypothesis (see Oh & Lee, 2004 &, Alper & Oguz, 2016).

The impact of renewable energy consumption on economic growth in ASEAN countries using Generalized Method of Moment (GMM) has been found to be positive (Fadihah, Lestari, Sahdan & Ahmad, 2020). Also, Bouyghrissi, Berjaoui and Khanniba (2020) investigate the nexus between renewable energy consumption and economic growth in Morocco from 1990 to 2014 using the ARDL and Granger causality test. The empirical findings support positive causality running from renewable energy consumption to economic growth. In addition, Hassan, Danmaraya and Danlami 2018) examines the link connecting energy consumption with manufacturing performance by using panel data to sample low-income and averages income SSA countries during the period of 1995-2013 and establish that energy consumption lead to increase in manufacturing performance.

In conclusion, the literature has established conflicting evidences among CO<sub>2</sub> emissions-growth nexus and energy-growth nexus, which justifies this study in re-examining this relationship by merging the CO<sub>2</sub> emissions-growth nexus with energy-growth nexus in Nigeria for better policy recommendation.

**3. Method of Analysis**

*Data and Description*

This study used time series data for Nigeria from 1980 to 2015 onelectricity production,CO<sub>2</sub> emissions, FDI, and economic growth from the World BankWorld Development Indicators. CO<sub>2</sub> emissions are measured by CO<sub>2</sub> emissions in kilo terms (kt) as FDI is measured by foreign direct investment percentage of GDP. Economic growth is proxied by GDP growth as electricity production is measured by electricity production from oil, gas and coal source (% of total).

*Empirical Model*

The model for this study is given by:

$CO_{2t} = f(GDP_t + EP_t + FDI_t)..... 1$

Where  $GDP_t$  is the GDP growth,  $CO_2$  indicates  $CO_2$  emissions, EP stands for electricity production, and FDI represents foreign direct investment. Taking the natural logarithm of equation (1) lead to the specification of equation (2) as follows:

$$\ln CO_{2t} = \eta_0 + \eta_1 \ln GDP_t + \eta_2 \ln EP_t + \beta_3 \ln FDI_t + \varepsilon_t \dots\dots\dots 2$$

Where  $\varepsilon_t$  is the error term,  $\ln$  represents natural logarithm,  $\eta_1, \eta_2, \eta_3$  are the parameters of  $CO_2$  emissions with respect to the independent variables.

*Unit Root Test*

Identifying the point of integration on each variable is the initial conventional procedure in time series analysis. This is because non-stationary time series data can lead to spurious regression. For that reason, all the variables are subjected to non-stationarity test by using the Augmented Dickey-Fuller (1979) unit root test. Confirming the series to be stationary qualifies the study to test for the presence of long run cointegration among the variable.

*Cointegration Test*

In this study, the Autoregressive Distributed Lag (ARDL) method advanced by Pesaran, Shin and Smith (2001) is used to examine the long run cointegration among the variables. The ARDL method is superior to other techniques because the method can be used without regarding whether the variables are integrated of order zero  $I(0)$  or order one  $I(1)$  or the combination of both as against other techniques such as Johansen which require the variable to be integrated of the same order. Likewise, this method accommodates small sample size. These properties have made the ARDL test to be a well-known approach lately. The ARDL model used in this study is given by equation (3):

$$\begin{aligned} \Delta \ln CO_{2t} = & \vartheta_0 + \sum_{k=1}^p \vartheta_{1k} \Delta \ln CO_{2t-k} + \sum_{k=1}^q \vartheta_{2k} \Delta \ln GDP_{t-k} + \sum_{k=1}^q \vartheta_{3k} \Delta \ln EP_{t-k} + \\ & \sum_{k=1}^q \vartheta_{4k} \Delta \ln FDI_{t-k} + \delta_{11} \ln CO_{2t-1} + \delta_{12} \ln GDP_{t-1} + \delta_{13} \ln EP_{t-1} + \\ & \delta_{14} \ln FDI_{t-1} + \varepsilon_{1t} \dots\dots\dots 3 \end{aligned}$$

Where  $\varepsilon_{1t}$  is the residuals which is assumed to be normally distributed,  $\Delta$  represents the first difference operator,  $\vartheta$  is the dynamics of error correction,  $\delta$  represent long run relationships.

Using  $F$ -test, cointegration relationship is examined among the variables where the null hypothesis that  $H_0: \delta_{11} = \delta_{12} = \delta_{13} = \delta_{14} = 0$  is tested against  $H_1: \delta_{11} \neq \delta_{12} \neq \delta_{13} \neq \delta_{14} \neq 0$ . In deciding cointegration among the variables,  $H_0$  is rejected if the  $F$ -statistic is greater than the upper bound. On the contrary, if  $F$ -statistic is less than the lower bound,  $H_0$  cannot be rejected, while the result becomes inconclusive if the  $F$ -statistic is between the upper and the lower bounds.

*The Long run estimations*

Following the cointegration test, next is to estimate the long run coefficients to determine the elasticities of the variable. Equation 4 presents the long run coefficients of the variable employed

$$\ln CO_{2t} = \eta_0 + \sum_{k=1}^p \eta_{1k} \ln CO_{2t-k} + \sum_{k=1}^{q_1} \eta_{2k} \ln GDP_{t-k} + \sum_{k=1}^{q_2} \eta_{3k} \ln EP_{t-k} + \sum_{k=1}^{q_3} \eta_{4k} \ln FDI_{t-k} + ECM_{t-1} + v_{it} \dots\dots\dots 4$$

Where *ln* represents the natural log,  $\eta$  is the long run coefficients, and  $v_{it}$  shows the white noise error term.

*The Short run estimations*

Having established the presence of cointegration and the long run estimates, we then estimate the short run coefficients and determine the ECM. Equation (5) presents the short run coefficients

$$\Delta \ln CO_{2t} = \lambda_0 + \sum_{k=1}^p \lambda_{1k} \Delta \ln CO_{2t-k} + \sum_{k=1}^{q_1} \lambda_{2k} \Delta \ln GDP_{t-k} + \sum_{k=1}^{q_2} \lambda_{3k} \Delta \ln EP_{t-k} + \sum_{k=1}^{q_3} \lambda_{4k} \Delta \ln FDI_{t-k} + ECM_{t-1} + v_{it} \dots\dots\dots 5$$

Where  $\lambda$  represents the short run coefficients,  $v_{it}$  is the white noise error term and  $ECM_{t-1}$  measured the speed of adjustment back to long run equilibrium. It is the adjustment mechanisms that stabilize the disequilibrium in the model.

**4. Results**

*Unit Root Test*

To find out the order of integration for each of the variable and detect the possibility of examining cointegration among the variables, this study used the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests in testing the stationarity properties of the series. Table 1 presents the unit root test result.

Table 1: *Unit Root Test*

Series	ADF		PP	
	Levels	First Difference	Levels	First Difference
<i>CO<sub>2</sub></i>	0.921 (0.491)	-5.336* (0.000)	0.511 (0.768)	-12.634* (0.000)
<i>GDP</i>	0.723 (0.903)	-5.953* (0.001)	-5.483* (0.000)	-9.549* (0.000)
<i>EP</i>	0.654 (0.673)	-8.883* (0.000)	0.246 (0.698)	-7.909* (0.000)
<i>FDI</i>	-0.657 (0.543)	-5.161* (0.003)	-0.769 (0.822)	-6.828* (0.000)

*Notes:* \* represents statistically significant at 5% level of significance. Figures in parenthesis represent probability.

*Source:* Authors' Computation

Table 1 showed that all the variables are non-stationary at level using ADF and PP unit root test with the exception of GDP, which is found to be stationary in level under PP test. However, after taking the first difference, all the variables turn back to be stationary. This means that the variables are combination of 1(1) and one 1(0)

variables. Hence, the study proceeds with the estimation of cointegration using the ARDL-Bound test.

*Cointegration Test*

In this sub-section, the ARDL model is employed to prove long run association between the variables. Table 2 presents the ARDL-Bound test to find out the long run connection among the variables.

Table 2: *ARDL Bounds Test Results*

Variables	F-stat	Lag	Sig. Level	Critical values	
				I(0)	I(1)
$F_{\ln CO_2} [\ln CO_2 / \ln GDP, \ln EP, \ln FDI,$	6.343*	2	10%	2.26	3.35
			5%	2.62	3.79
			1%	3.41	5.62

Note: \* represents 5% level of significance

Source: Authors' Computation

From Table 3, the result of the bound test pointed out that the estimated *F*-statistic of 6.343 is greater than the upper bound at 5% significance level. Therefore, we reject null hypothesis of no cointegration at 5% level of significance and conclude that long run relationship exist among the variables. Establishing long run relationship among the variables gives an opportunity to estimate the long run and short run coefficients.

*Long Run Coefficient*

Confirming the presence of cointegration among the variables qualifies this study to estimate the long run coefficients of the variables employed. Table 3 demonstrates the long run coefficient of the variable.

Table 3: *Long Run Coefficients. Dependent Variable:  $\Delta \ln CO_2$  Emissions*

Variable	Coefficient	Standard Error	t-Statistic	Prob.
$\Delta \ln GDP$	0.215	0.080	2.687*	0.000
$\Delta \ln EP$	0.492	0.134	3.671*	0.001
$\Delta \ln FDI$	0.136	0.027	5.037**	0.040
<i>C</i>	5.602	0.859	6.526**	0.000

Note: \* and \*\* represents 1% and 5% level of significance, respectively.

Source: Authors' Computation

Table 3 demonstrates that economic growth has positive significant effect on  $CO_2$  emissions in Nigeria. The coefficient of 0.21 indicates that 1 % increase in economic growth lead to 0.21% increase in  $CO_2$  emissions in Nigeria. Similarly, electricity production has positive significant impact on emissions as 1% increase in electricity production would increase  $CO_2$  emissions by 0.49%. The result of electricity production and economic growth followed the findings of Ali, Law and Zannah (2016) on Nigeria which revealed a positive impact of economic growth and electricity production on  $CO_2$  emissions. Furthermore, the coefficient of  $CO_2$  emissions with respect to FDI is 0.13 which signifies that the impact of FDI on  $CO_2$  emissions in Nigeria is quite low. In this case, a 1% increase in FDI will translate to a 0.13% increase in emissions. This result replicates the studies of Acharyya (2009)



for India which discovered a positive effect of FDI to  $CO_2$  emissions. In general, both economic growths, FDI and electricity production increases environmental degradation in the long run.

*Short Run Coefficient*

Establishing the long run relationship and the coefficients of the long run allow the study to estimate the short run coefficients of the variables. Table 4 explain the short run ECM and coefficients of the variables.

*Table 4: Short Run Estimation*

Variable	Coefficient	Standard Error	t-Statistic	Prob.
$\Delta \ln GDP$	0.290	0.052	5.576	0.104
$\Delta \ln EP$	0.498	0.125	3.989*	0.001
$\Delta \ln FDI$	0.024	0.026	0.919	0.372
$\Delta \ln FDI (-1)$	-0.102	0.018	-5.534*	0.000
$ECT(-1)$	-0.695	0.130	-5.346*	0.000

*Notes: \* represents statistically significant at 5% level of significance*

*Source: Authors' Computation*

Electricity production and FDI increases  $CO_2$  emissions positively as in the long run, the coefficients of the short run shows that economic growth is not significant in explaining  $CO_2$  emissions. The ECT measured the speed of convergence to the long run equilibrium, which is expected to be negative and less than one. The coefficient of 0.69 for the ECT reveals 69% speed of adjustment and converge to the long run equilibrium within one year.

*Diagnostic Check*

To ensure the consistency and efficiency of the estimated models, the study conducted diagnostic check on the models. Table 5 shows the result of serial correlation, normality and Heteroscedasticity test. From the table, the null hypothesis of no serial correlation, normality and Heteroscedasticity cannot be rejected. Hence, it can be concluded that the model has passed all of the diagnostic checks conducted.

*Table 5: Diagnostic Test of the ARDL Model*

Test Statistics	F-statistics	Prob.
Autocorrelation	0.631	0.314
Normality	0.210	0.735
Heteroskedasticity	0.734	0.458

*Source: Authors' Computation*

The stability of the model is proved by the cumulative sum of recursive residuals (CUSUM) and cumulative sum of recursive residuals square (CUSUMQ). Figure 1 and Figure 2 shows that the series are within the critical bound at 5% significance level which confirmed the model to be stable over time.

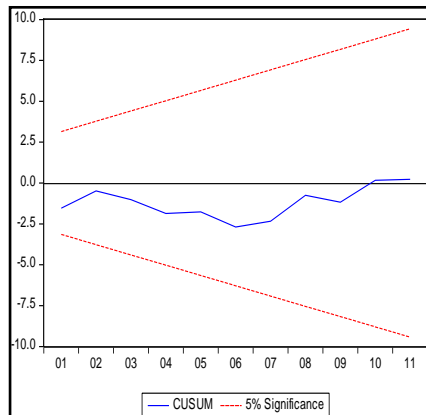


Figure 1: CUSUM

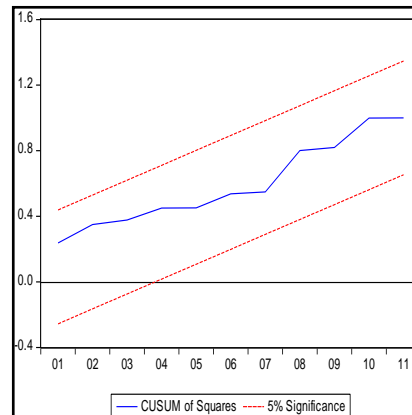


Figure 2: CUSUMQ

### 5. Policy Implication and Conclusion

From the policy point of view, policy makers should provide policies that will reduce environmental pollution with little or no harm to economic variables. Based on the findings of this study, policy makers should give more attention to economic growth, electricity production and FDI. This is owing to the fact that they contribute more to environmental pollution in Nigeria.

In conclusion, this study examined the effect of economic growth, FDI, and electricity production on  $CO_2$  emissions in Ghana for the period of 1980-2015. The result of the cointegration test established the presence of a long run relationship among the variables. Furthermore, the coefficients of the long run reveal that economic growth, electricity production and FDI positively affect  $CO_2$  emissions in Nigeria. Also, the short run ECM showed about 69% speed of adjustment back to the long run equilibrium.

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## Long –Run relationship between population growth and economic growth in Nigeria.

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### Abstract

*This research work analyzes the impact of population growth on economic growth in Nigeria by using time series data sourced from central bank statistical bulletin from 1981 to 2016 for Nigeria. The ordinary least square (OLS) technique was employed to estimate the influence of the explanatory variables. It was found that co-efficient [R<sup>2</sup>] of 40% variation in economic growth was explained by the variation in the independent variables and population growth has positively and significantly affects gross domestic product over the period of the study. Other like additional explanatory variable like government expenditure on health is negatively related to economic growth according to the results. To determine the long-run relationship between the two variables, Augmented Dickey Fuller (ADF) test found that the two series were stationary. The ECM result revealed that population growth and economic growth had long-run relationship. The research concludes by recommending that government should adopt policies that will promote human capital development and make the teeming population more productive to further boost the economy.*

**Keywords:** Economic growth, Population growth, ECM

**JEL Classification:** J11, O47, P23

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### 1. Introduction

The link between population growth and economic development has been a topic of discourse for a very long time, perhaps not well documented. As far back as 500AC pre-Islamic Arabs were reported to had been practicing depopulation perhaps brutally, for fear of too much economic burden and poverty. Infanticide was a normal practice amongst Arabs, especially female infanticide, on the ground that female kids have less economic value to add to the household Giladi(1990) see also (Q5:61, Q81:8-9, & Q17:31). This view of population growth as impediment to economic growth is similar to one of the most prominent theories of population of Thomas Malthus, which states that population growth contribute negatively to per capita income and deteriorates human development index. Thomas Malthus warned

about the danger of “over-population”. As Kelley and Schmidt (1996, 13) commented, “Pessimism about the economic impacts of population has dominated the thinking of population analysts since the original alarmist treatise by the Reverend Thomas Malthus was published over two centuries ago”.

Ironically, richer countries seem to have lower population growth. For example, a country like Niger, where the total fertility rate is 7.00 children per woman, is sixty-one times poorer than the United States, where the total fertility rate is 2.05. Qatar with 1.91 fertility rates is twenty-six times richer than Nigeria where fertility rate is 5.53 birth per woman. This compelling statistics has convinced many, including academicians and policy makers, of the validity of the old argument first popularized by the Reverend Thomas Malthus, at the turn of the eighteenth century (Abhijit & Duflo, 2011). Malthus believed that the resources countries have are more or less fixed, land was his favorite example, and he therefore thought that population growth was bound to make them poorer.

Yet this is less obvious than it sounds. After all, there are many times more people on the planet today than when Malthus first formulated his hypothesis and most of us are richer than Malthus’s contemporaries. Technological progress, which did not figure in Malthus’s theories, has a way of making resources appear from nowhere; when there are more people around, there are more people looking for new ideas, and so perhaps technological breakthroughs are more likely. Indeed, for most of human history (starting in 1 million BC), regions or countries that had more people were growing faster than the rest (Kremer 1993).

It therefore, suggests that the impact of population growth on the economic development of less developed countries and developed countries are not the same because the conditions prevailing in these economies are quite different and the relationship between the variables in developing countries is very complex (Yao, *et al.*, 2013). Rapid population growth is said to be the demographic pattern of most developing countries, characterized by high birth rates and death rates; where as that of developed economies is stable in which both birth and death rates are low. And the fact that today, countries with higher fertility rates are poorer, doesn’t mean that they are poorer because of high fertility: It could be that they have high fertility because they are poor, or some third factor could cause both high fertility and poverty. Even the “fact” that periods of rapid economic growth often coincide with sharp declines in fertility, as in Korea and Brazil in the 1960s, is ambiguous at best (Abhijit & Duflo, 2011).

Despite the importance attached to capital in his classical economic growth theory, Robert Solow noted that, capital alone cannot by itself explain the sustained economic growth observed in most parts of the world, and Simon (1996, 589) put it more accurately, “The ultimate resource is people – skilled, spirited, and hopeful people who will exert their wills and imaginations for their own benefit, and inevitably they will benefit not only themselves but the rest of us as well”. Indeed, for the most part the literature on the relationships between population and economic growth is one of unusual empirical consensus.

Moreover, the population of any country constitutes the most vital component of its resource base. This aspect is based mostly on its size, growth rate, spatial distribution, demographic structure and quality in terms of level of education, skills etc. Policy makers consider population to be an indispensable tool for economic planning for government, businesses and individuals. Any serious government keep close track of its population growth to estimate the need for infrastructures and necessary skills and knowledge for the future workforce; and to invest wisely in health research and development.

Consequently, the world population has been increasing and the last two decades have been demographically unprecedented as it rose from 4.7 billion people in 1985 to 7.2 billion in 2015. Much of this occurred in the developing nations as their population grew from 3.6 billion to 5.9 billion as against that of developed nation which grew from 1.1 billion to 1.3 billion over the same period (United Nation, DESA 2016).

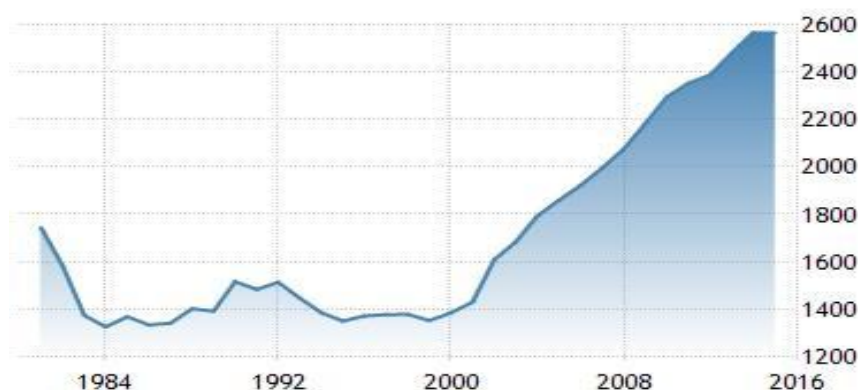
Nigerian has one of the fastest growing populations in the world. Nigeria is termed the "giant" of Africa, because of its economy and population. She is the most populous country in Africa and seventh globally with an estimated population of over 185 million in 2016, 3% annual population growth and a total fertility rate of 5.53 births per woman. The reason for the uncontrolled population growth since the mid 20th century is the decrease of infant mortality and general increase of life expectancy without a corresponding reduction in fertility rate, due to a very limited use of contraceptives. The large population implies a large market for goods and services as well as large pool of human resources for development. However, the impact of population on development depends not only on the absolute size but also on its quality. Many argues that uncontrolled population growth threaten to overwhelm infrastructure development and can cripple economic development. A quite number of developing countries are pursuing programs to promote family planning in an attempt to curb population growth rates in Nigeria, whose population is estimated to be growing at 3% per annum.

Despite all these it was not until mid 1980s that Nigeria began to see the uncontrolled population growth as a problem, because the nation enjoyed oil boom in the 1970s. Nigeria started to see increased population as a threat when oil prices declined drastically in the international market. It became crystal cleared that it could no longer adequately provide for the teeming population, then the need to adopt a population policy become imperative. Since then population policy had been adopted to curb population growth. The country's first national policy on population was promulgated in 1984 and later revised in 2004. All these policies were normally short lived and ineffective due to the nation's multiculturalism, religious beliefs among other things. It is then important to answer this question, how detrimental is population growth to the economic growth? This study therefore, set to analyze the impact of population growth on economic development in Nigeria. it contribute to the literature by: using a new data set starting from 1981 to 2016 and applying a comprehensive set of explanatory variables to explain the intricate relationship between the variables.



Nevertheless, the economic indicator that best describes the relationship between economic growth and population is GDP or GNI per capita — GDP divided by the total population. GDP and GNI numbers show a country’s aggregate economic growth. But it's often more important to know how individual citizens are doing economically. This equation implies that if population is rapidly growing faster than GDP, such increase in population would negatively impact the economy and vice versa. A country may seem to be doing well with a high or increasing GDP. But if its population has grown as well, then its total income will be spread out over more people. This makes the country poorer than one showing a lower aggregate production but supporting a much smaller population.

*Relationship between population and economic growth*



Source: *tradingeconomics.com*

This figure (Figure 1) represents the variations in population with respect to per-capita income. It is evident from this graph that the slope is positive meaning that as population increases in Nigeria over the time, per-capita income follows. This graph is a summary of population growth relationship to per-capita income between 1981 and 2016. In 1981 the cumulative population in Nigeria was 75 million and the per-capita income was around 1700 USD. As years go by, population grows as well as per capita income up to the level that in 2016, the cumulative population was 185 million and the per-capita income was 2600 USD. This figure helps us to stand on the hypothesis that: population growth is positively related to economic growth. The variables move in the same direction, we can therefore conclude at this level that there is an apparent positive relationship between population growth and per capita income. To cast out any doubt we follow our analysis using advanced econometric tools, which we develop at the data and methodology section.

**2. Literature Review**

There is no consensus on the actual relationship between population growth and economic growth in economies around the world. The nature of this relationship has so attracted the attention of a large number of world’s most influential thinkers that most of them have started propounding theories to explain it. Generally, the various explanations of the relationship between population growth and the society

have focused on the causes of population growth, the consequences of population growth, and the responses of people to population growth. Most of the early writers on population growth were very much concerned with the need to balance population with resources. Currently there are two absolutely parallel and well developed theories of population, which are optimistic (Kremarian) and the other pessimistic (Malthusian).

Thomas Malthus was an English clergyman who lived from 1766-1834. He was widely known as the first professional demographer. It was during the period of the physiocrats thinking in the 18th century that he postulated his theory. He had the most influential work relating to population growth and its consequences. He was the first man to draw out in a systematic way a picture that links the consequence of growth to its causes. According to him, population grows geometrically, while resources arithmetically. Meaning that, the increase in population is faster than food supply. Malthus was of the opinion that in the absence of a formal check on population, scarce resources will be distributed among an increasing number of individuals in the short run. If such checks do exist, Malthus has divided them into two categories, preventive and positive. In the absence of these two checks, the rate of population is maintained by diseases, famines, war and earthquakes (Malthus, 1798).

Whilst Malthus saw population growth as a threat to rising living standards, economist Michael Kremer has suggested that world population growth is a key driver of advancing economic prosperity. If there are more people, Kremer argues, then there are more scientists, inventors and engineers to contribute to innovation and technological progress. As evidence for this hypothesis, Kremer begins by noting that over the broad span of human history, world growth rates have increased together with world population. If technological progress is more rapid when there are more people to discover things, then the more populous regions should have experienced more rapid growth. And, indeed they did. Kremer concludes from this evidence that a large population is a prerequisite for technological advance (Kremer, 1993).

#### *Related Literature*

There are little empirical evidences on the relationship between population growth and economic growth and much of the empirical evidence of the relationship uses cross section at data across countries. For example (Jacob, Cesaire, & Marie, 2016) explored this relationship on a sample of 30 most populated countries of the world, regardless of their level of development. Jacob et al (2016) employed Error Correction Model (ECM) to test if there is a long run relationship between population growth and per capita income. The ECM result revealed that there is a long run equilibrium relationship between population growth and economic growth, and the granger causality test showed that there also exists a bi-directional causality between economic growth and population growth and concluded that population growth and economic growth are positively related. On the contrary, Dao (2012) conducted similar study using a sample of forty-three developing countries and concluded that, the effect of population growth on per capita GDP growth is linear and negative everywhere.

Similar studies conducted across several regions reported a strikingly negative associations between the two variables, Thorn (2001) in seven Latin American countries and Song (2013) in Asian countries, though Song was able to disintegrate the impact of population growth on economic development on different structures of population and reported a positive association with the growing working-age population and concluded that the rapid economic growth in Asia can be the result of the favourable demographic changes that took place there.

Numerous researches reinforce the pessimistic view of population growth as impediment to economic development by reporting a significantly negative statistical relationship between the two variables (See Dawson & Tiffin, 2004; Afzal, 2009 & Yao, Kinugasa & Hamorib, 2013). Specifically Yao *et al.* (2013) empirically tries to understand the factors behind the unprecedented growth in China over many decades and reported that all the variables (Total Factor Productivity, Savings and Degree of industrialization) except population growth have positive impact on GDP.

On the other hand, findings from other studies empirically supported the population-driven economic growth hypothesis; Furuoka (2014) reports the existence of long-run positive and bi-directional relationship between population growth and GDP in Thailand. Ali *et al.*, (2013) reported that population growth had positive impact on economic growth in Pakistan. Similarly, Adediran (2012) found that population growth was positively affected by growth in per capita income and population growth also positively influence per capita income indicating a positive bi-causal relationship between the two in Nigeria.

Olabiya, (2014) examined the relationship between population and economic growth in Nigeria using the data from 1980 to 2010, specifically focusing on the effects of fertility and infant mortality rates on the economic growth. The method of estimation was Vector Auto Regressive (VAR) econometric techniques. The results showed that decrease in fertility rate increase economic growth gradually from 3.3% to 7.9% for horizon of 12 years during the period of the study. Also, an increase in infant mortality rate increase economic growth rate from 0.6% to 15.9 % for same time horizon.

Onwuka (2006) empirically tested the association between population growth and economic development in Nigeria between 1980 and 2003 making use of OLS technique. He found that growth in population outweighed that of output and that this had negatively affected development in the country because a considerable proportion of the nation's resources were consumed rather than accumulated for development purposes. However, in much of the developed world where the fertility rate was widely noted to have fallen well below the replacement rate of 2.1 children per woman, Livi-Bacci (1997) examined demographic shocks from a historical perspective and noted that there had been huge decline in fertility rate throughout the industrial world and that only the United States had a fertility rate that was close to the replacement level among the ten largest high income eaner countries. He noted that the plague of demographic shocks resulted in a century of depopulation in Europe. The consequent shortage of labor was said to have resulted

in higher real wages; land previously cultivated were turned into pasture; and families and landholdings were restructured into larger units. Weil (1997) showed skepticism on whether the traditional Malthusian mechanism was currently operative but noted then that there appeared to be little relationship between income per capita and the birth rate in industrial countries.

Boucekkine (2003) showed that in the budding industrialization in Europe, as mortality generally decreased at adult age in the 19th and the beginning of the 20th century in Europe and North America, it was followed by decrease in fertility that drew down dependency rates and accelerated economic growth rates to levels never observed before. However, in the late 20th century, mortality gain above retirement age became predominant.

Mokyr (2001) argues that the variant of the model that best describes the current situation in industrial countries is one where, as income increases beyond some threshold, the birth rate decreases. His reason was that raising children and consuming goods and services both take time. As income goes up and people can afford to increase their consumption, they choose to spend less of their time on children and as such causing the birth rate to decrease. If the birth rate falls below what is needed for population replacement, real wages and incomes will rise as a result of the declining population, reinforcing the process. Hahn and Park (2009) considered fertility rate, working-age population ratio, and population growth rate as three alternative demographic indicators in a cross sectional study. For each of the indicators, they constructed the measure of the speed of demographic transition and considered three specifications as the “standard” regression models. Two of them were as suggested by Levine and Renelt (1992) and one with additional explanatory variable. The first regression from Levine and Renelt (1992) include explanatory variables, initial real GDP per capita, investment share of GDP, initial secondary-school enrollment rate and the average annual rate of population growth. The second regression from Levine and Renelt (1992) had almost equivalent structure to Barro (1991), which, in addition to the first specification, included primary-school enrolment rate, average rate of government consumption expenditure to GDP, a dummy variable for socialist economic systems, indicators for revolutions and coups, and dummy variables for countries in Latin America and sub-Saharan Africa. The third regression includes institutional quality, openness, natural resource abundance, and terms of trade growth in addition to the explanatory variables in the second regression. They used OLS, as well as GMM estimation technique to address the endogeneity problem that might exist in measures of speed of demographic transition. They found average estimated speed of change in fertility rate in the whole sample to be about -0.06, which means that it took about 17 years on average for fertility rate to decline by one, say, from 3 to 2 children per woman.

In the study conducted by Klasen and Lawson (2007), as reported by Dao 2012, the link between population, per capita growth and poverty in Uganda was examined. The research was conducted using both cross-section data and panel data. The results of the estimates show that population growth has a positive impact on overall economic growth. But the coefficient is always smaller than 1 suggesting

that the additional people have a less than proportionate influence on economic growth. In the cross-sectional specification, the impact is generally larger than in the panel specifications. From the discussion above, this is to be expected since the (positive short-term) impact of income growth on population growth is likely to reduce the negative coefficient in the panel specification. The impact of population growth on economic growth does not appear to be different in Sub Saharan Africa from elsewhere.

Prskawetz (2007) also was of the view that demographic factors matter for economic growth just as much as, or sometimes even more than, the factors commonly stressed in the growth literature, such as technological change, innovation and political/institutional explanations. Through a series of tests, they found that demographic effects turned out to be extremely robust, independent of the economic variables included and the specific method (cross-country vs. panel data regressions) applied. Control variables that entered the equation significantly were Life Expectancy at Birth, Hours Worked, Employment Rate, Phone Lines, Crude Birth Rate, Total Fertility Rate, and Capital Stock. From the forgoing, the importance of demography in the process of economic growth and development has been recognized.

Bringing these two polar views of the impacts of population growth on economic development together, Yamaguchi (1973) as cited in Yao et al (2013) categorized the impacts as either direct or indirect. The direct impacts of population growth on economic development, in Yamaguchi's view, are negative as they lead to lower income per capita. The indirect impacts, by contrast, are positive in that they promote economic development by accelerating technological progress. Yamaguchi (1973) arrived at these results based on empirical analyses of experiences in Japan Thailand, China and Taiwan, concluding that the overall impact of population growth on economic development is positive.

Depending on the framework used and the economy in question, the effects differs greatly. While some studies reported strong positive/negative relationship others suggested a very weak relationship between population growth and GDP (see for example Easterlin, 1976 & Weil, 1997). Whereas indirect studies, based on neo-classical production functions, show that the effect of population growth on per capita income growth is neutral (e.g. Thirlwall, 1972).

Notwithstanding, the volume of research performed thus far is substantial, there still remains a shortage of studies of the experiences of individual countries over long periods. Therefore, it has tend to examine the general experiences of individual countries. However, nigeria with unimpressive rates of economic growth and unfavorable demographic environment has little empirical evidence on the relationship with diverse findings. Hence, this study critically examined the relationships between Nigeria's population dynamics and economic growth with a view to finding by how much would income per capita change if the fertility and infant mortality rates change by a specified amount.

**3. Methodology**

The study examines population and economic growth in Nigeria: An empirical analysis. The methodology of this study is ordinary least square (OLS) technique, which was used to estimate and analyze the influence of the explanatory variables; Population (POP), Death Rate (DHR), Government Expenditure on Health (GEH) on Gross Domestic Product (GDP) at current price as the dependent variable. This research work embraces the use of secondary time series data. The analysis employed consists of the following: Regression, the Augmented Dickey Fuller (ADF) unit root cointegration tests and the Error Correction Model to examine the long run movement between population growth and economic growth in Nigeria.

*Data Sources*

Data used for this study were secondary data. They are annual time series data on gross domestic product, population, death rate, government expenditure on Health. All data used for the impact of population are sourced from Central Bank (CBN) statistical bulletin for 2016 volume 27 and various other recognized sources.

*Model Specification*

The hypothesis had been stated with the view of ascertaining the significant impact of population growth on Nigeria economic growth. The functional form of the model is as expressed below;

$$\text{GDP} = f(\text{POP}, \text{DHR}, \text{GEH}) \dots\dots\dots 1$$

Equation 1 reads that Gross Domestic Product is a function of population, death rate, government expenditure on health. In order to capture the influence of the stochastic or random variable, the equation is explicitly transformed as

$$\text{GDP}_t = \beta_0 + \beta_1\text{POP}_t + \beta_2\text{DHR}_t + \beta_3\text{GEH}_t + U_t \dots\dots\dots 2$$

By logging the model we have

$$\log\text{GDP}_t = \beta_0 + \beta_1\log\text{POP}_t + \beta_2\log\text{DHR}_t + \beta_3\log\text{GEH}_t + U_t \dots\dots\dots 3$$

Where; GDP is the gross domestic product, POP represent population, DHR measured death rate, GEE stands for government expenditure on health,  $\beta_0$  is constant,  $\beta_1, \beta_2, \beta_3$  are the parameter estimates, and  $U_t$  means error term.

**4. Results**

The populations of a country play a crucial role in the growth of the economy. The economic effect is rapid, compared to the slow or moderate rate of population. This shows through several ways, which include population size and rate of growth, age distribution of population and labor force in relation to the total population. The method of regression analysis is used in this chapter to analyze the relationship between population growth and POP, GDP, GFCF and inflation of the period 1983 to 2014 was used to cover the period.

*Unit Root Test*

In other to test for the presence or absence of unit root in the data used for the empirical analysis, Augmented Dickey-Fuller (ADF) test was employed and the test result is as presented below:

**Table1: Augmented Dickey Fuller Unit Root Test (Trend and intercept)**

Variables	ADF @ 1 <sup>st</sup> Level	difference	Critical value (1%)	Critical value (5%)	Order of integration	Remarks
(GDP)	2.128327	5.279981	4.273277	3.557759	I(1)	Stationary
(POP)	3.602878		4.273277	3.557759	I(0)	Stationary
(DHR)	0.244451	5.385163	4.374307	3.603202	I(1)	Stationary
(GEH)	4.607181		4.262735	3.552973	I(0)	Stationary

*Source: Authors' Computation*

From Table 1 above, at 5% level of significance, two of the variables (POP and GEH) for this regression was stationary at level since by comparison, their critical values were less in absolute values than their augmented dickey fuller (ADF) test statistics. However, at first difference, the remaining two variables (LR, and INT) were stationary. Thus, two of the series (POP and GEH) are stationary and integrated of the first order, I (0) while the remaining two series (GDP and DHR) are also stationary and integrated of the second order I (1). Since the variables are stationary, the Johansen cointegration was conducted to test for the long-run relationship.

*Co integration Result*

Co integration was used to test for the long run relationship between the variables considered. For this purpose, the Johansen cointegration test was adopted. In Johansen's Method, the eigenvalue statistic is used to determine whether cointegrated variables exist. Cointegration is said to exist if the values of computed statistics are significantly different from zero or if the trace statistics is greater in absolute value than the critical value at 5% level of significance. The model with lag 1 was chosen with the linear deterministic test assumption and the result is presented below.

**Table 2: Johansen CointegrationTest**

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.613066	62.52122	47.85613	0.0012
At most 1 *	0.414966	32.13715	29.79707	0.0264
At most 2	0.321764	14.98240	15.49471	0.0596
At most 3	0.076828	2.558081	3.841466	0.1097

*Trace test indicates 2 cointegratingeqn(s) at the 0.05 level, \* denotes rejection of the hypothesis at the 0.05 level, \*\*MacKinnon-Haug-Michelis (1999) p-values*

*Source: Authors' Computation*

The results of the co-integration in the table above indicated that the trace statistics is greater than the critical value at 5% level of significance in two of the hypothesized equations. This confirms that there is at least two co integrated relationship among the various variables used to model the relationship between population growth and economic growth in Nigeria for the period under study. Specifically, they are  $62.52122 > 47.85613$ , and  $32.13715 > 29.79707$ . Also, their p-value are less than 0.05 (0.0012, and 0.0264) respectively. In other words, the null hypothesis of no co integration among the variables is rejected. Hence, the test

result shows the existence of a long-run equilibrium relationship in three cointegrating equations at 5% significance level. The normalized co integrating coefficients for one co-integrating equation given by the long-run relationship is

$$\log\text{GDP} = 68.84683\log(\text{POP}) + 30.48963\text{DHR} - 7.906051\log(\text{GEH}) \dots\dots\dots 4$$

(13.9031)
(6.36130)
(1.36778)

Where GDP is the dependent variable, 68.84683 is the coefficient of population (POP), 30.48963 is the coefficient of death rate (DHR) and -7.906051 is the coefficient of government expenditure on health (GEH). The values in this relationship were extracted from the Johansen’s Co integration Test under the “Normalized Co integration Coefficients: 1 Co integrating Equation” sub-section. They are coefficients showing the direction and strength of the relationship between the explanatory variables and dependent variable in the long-run.

*Error Correction Model (ECM)*

It has been pointed out earlier that the error correction mechanism (ECM) is meant to tie the short-run dynamics of the cointegrating equations to their long-run static dispositions in order to maintain equilibrium. In order to capture the short run fluctuation, the Error Correction Method (ECM) was employed and the result is presented below.

Table 3: Error Correction Model Result  
Dependent variable: LOG (GDP)

Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	-44.39407	4.886619	-9.084823	0.0000
LOG(POP)	3.345807	0.702355	13.30639	0.0000
DHR	1.604523	0.412285	3.891778	0.0006
LOG(GEH)	-0.001399	0.054050	-0.025876	0.9795
ECM(-1)	-0.605458	0.146490	-4.133104	0.0003
R-squared	0.994093			
Adjusted R-squared	0.993250			
S.E. of regression	0.180048			
Sum squared resid	0.907683			
Log likelihood	12.46560			
F-statistic	1178.098			
Prob(F-statistic)	0.000000			

*Source: Authors’ Computation*

The ECM coefficient has three criteria that it must satisfy, one is that it must be negative; two is that it must be in fraction and three is that it must be statistically significant. From the table ECM (-1) -0.60 meet the above criteria, it was consistent by assuming a negative values, was statistically significant and was in fraction form..It suggests that if in the short run variables deviate from equilibrium,



they tend to re-adjust themselves back to equilibrium in the long run. The speed of this adjustment is 60% per annum.

#### *Implications of the Study*

The OLS result presented above showed that GDP had a positive relationship with population, a 1% increase in population brought about 7.97% increase in GDP, a positive relationship with Death rate, showed that a 1% increase in DHR led to a 1.1% increase in GDP and a positive relationship with government expenditure on health showing that a 1% increase in government expenditure on health brought about a decrease in GDP by 0.09%. The relationship between economic growth and population conformed to a priori expectation. The implication is that GDP moves in the same direction with population and it is in line with the Liberalist theory that were of the opinion that increase in labour supply may have a synergistic effect on Productivity. Equally, the positive relationship between economic growth and death rate which does not conform to economic expectation implies that economic growth and death rate moves in the same direction, meanwhile economic growth can only be propelled by increase labour force which will be hampered by death rate. At the same time, the positive relationship between economic growth and government expenditure on health, indicates that government expenditure on health have positive relationship with economic growth, which conforms to the priori expectation. As an increase in government expenditure on health lead to higher life expectancy rate and invariably better and efficient labour force, and in turn lead to economic growth, though the coefficient was statistically insignificant.

#### **5. Conclusion and Recommendation**

This study like many others attempted to provide additional empirical evidence to the on going debate about the complex nature of there relationship between population growth and economic development. The findings from the econometric analysis of this study make the path smooth for us to reach the conclusion that, there is a long-run dynamic relationship between population and economic growth in Nigeria. The effects of population on GDP may be the results of increased labour force which increases labour supply and consequently the stock of capital in the economy.

These findings give support to the population-driven economic growth hypothesis that states that, the population growth in a country promotes its economic development. Despite this the growth in GDP is not as promising as it should be and it clearly shows that the trend is not sustainable without purposeful effort from the authorities. The unfavorable match between population growth and means of subsistence in the country has breed poverty, diseases, unemployment and other social ills. Nigeria needs to design an intervention programmes that will help in reducing population growth rate and stimulate socio-economic development. Government should create enabling environment that will facilitate savings, investment, innovation, entrepreneurship and technical know-how.

Despite the positive relationship that exists between population and economic growth in Nigeria as revealed by this study, economic potentials of the country have not been maximized. It is on this basis that the following recommendations

were made: Since population had a positive impact on economic growth in Nigeria, there is need for government to adopt policy that will promote human capital development, this will ensure that the teeming population will be engaged productively which will result to an increase in output and as well lead to an increase in export and in the long run boost of economic growth. Government expenditure on health should be increased and channeled properly towards its objective as this will increase the life expectancy rate of the population. This will ensure that the good heads are around for transfer of knowledge from old generation to new generation.

There should also be an increased in Government expenditure on education this will also ensure an improvement in the quality of education as well as large pool of competitive and productive labor market which can even be supplied to the rest of the world. Government should make concerted effort to check population growth rate. Any population growth that occurs too fast will have diminishing returns or create a circumstance where economic growth is stagnating. Policy-makers need to be careful too, when trying to influence the economy through changes in macroeconomic variables such as money supply or interest rate; while aiming to correct macroeconomic ills such as inflation or unemployment. They may inadvertently depress economic growth.

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## Monetary Policy amidst COVID – 19 Pandemic in Nigeria

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### Abstract

*This study examined the effectiveness of monetary policy on economic growth in Nigeria within the COVID-19 period spanning from December 2019 to October 2020. Three most adjusted monetary policy instruments were employed: the monetary policy rate, the exchange rate and broad money supply, which were made the explanatory variables. The growth rate stood as the dependent variable. Granger Causality and Vector Auto-Regressive (VAR) were employed for the analysis as informed by the unit root tests. It was found that, when applied individually, monetary policy rate and exchange rate granger caused economic growth while broad money supply did not. When jointly used, all three variables granger caused economic growth. Also, It was found that, monetary policy rate and exchange rate have significant impact on economic growth while broad money supply could not have any significant impact amidst the COVID-19 Pandemic period. This study therefore, suggests that, the monetary authorities could use the instruments of monetary policy rate and exchange rate to motivate economic growth amidst pandemic periods like this. More so, pumping out money can only have significant impact when the use of such money is guided for the intervention purpose only. If not, it could end up causing serious inflation.*

**Keywords:** COVID-19 Pandemic, Economic Growth, Monetary Policy

**JEL Classification:** E51 E52 I18

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### 1. Introduction

The global economy was brought to a standstill as a result of the novel corona virus (COVID-19). The whole world was very much in fear because of the Severe Acute Respiratory Syndrome (SARS) permeates the fibres that hold the global economic activities together. This situation led to shutdown of major economic activities leaving only, in some special cases, essential services that are considered to be very necessary for human existence.

The healthy status of many countries' economy were likely affected by the spillover effect that which be as a result of the spread of covid-19 pandemic causing uncertainty to people in their home countries.

Monetary policy is a course of action that guide the principle and the control of flow of fund by the financial or monetary body – Central Bank of Nigeria (CBN) – in order to foster economic growth and development. The basic objective of monetary policy includes price stability, job creation, strong financial system, exchange rate stability, healthy balance of payment, sustainability of economic growth and development (Nnanna, 2001; Altman, 2003; Ikoh, 2010; Omotola, 2013; Acha, Ikoh&Nsien, 2016).

The CBN constitute the Monetary Policy Committee (MPC) who on regular basis meet to evaluate and decide on the performance of the economy regarding the instrument adopted and seeking to make changes in case the instrument adopted is not yielding the expected result. Monetary policy application is done through the use of the instruments like Monetary Policy Rate (MPR), Open Market Operation (OMO), Cash Reserve Ratio (CRR), Liquidity ratio (LR) and Treasury Securities. In the last meeting of the MPC in Nigeria on 22nd September, 2020, the CBN Governor Godwin Emefiele announced that the committee has voted to adopt CRR at 27.5%, MPR at 11.5%, LR at 30% and adjusted asymmetric corridor from -200/-500 to +100/-700 basis point around the MPR(IMF, 2020). Hence the committee observed that this decision may stifle that recovery of output growth and there is likelihood of economic contraction. The Central Bank of Nigeria (CBN) cut monetary policy by 100 basis points and expanded liquidity availability for non-bank financial institution, reducing interest rates on all applicable CBN interventions from 9% to 5% and introducing a one year moratorium on its intervention facilities, liquidity injection of 3.6 trillion into the banking system, including N100 billion to support the health sector, N2 trillion to manufacturing sector and N1.5 trillion to the real sector, among other. Still in response to COVID-19(IMF, 2020), the official exchange rate was adjusted from N307 per US dollar just before the pandemic to N361 at the start, and then gradually continued to increase up to N385 per dollar and even beyond(IMF, 2020). There exists an ongoing unification of different exchange rates under the investor and exporter (I&E) window, bureau de change, and retail and wholesale window, with the sole aim of making I&E rate trend in line with determination of exchange rate according to market forces (IMF, 2020).

However, the committee members were of the view that the option to ease will complement the bank's commitment to sustain the trajectory of the economic recovery and reduce the negative impact of COVID – 19 (CBN, 2020). In the heat of the pandemic policy options were dosed out like tax holiday, palliative for indigent ones in the society, interest rate reduction among others. Also, online platform for business was highly encouraged due to restriction of movement and prohibition of body contact in addition to new ways of distribution of goods and services through dispatch riders.

Adopting the right monetary policy amongst alternative macroeconomic frameworks remain a fundamental factor in policy making that can make or mar the economic fortune of any nation. scholars have argued that, the efficacy of the monetary policy is primarily in the achievement of the intended purpose (Chuku, 2009; Altman, 2003), but others like Fasanaya, Onakoyand Agboluaje (2013);

Adeoye, Ojapinwa and Odekunle (2014) and Aliyu and Englama (2009) were of the view that local price fluctuation is paramount in the hindrance of the success of monetary policy hence frustrating investment and growth in the economy.

In the face of this loop nest of economic dilemma of policy crises, comes the pandemic that brought the world economy to its knees, thereby making various economic policies ineffective and unrealistic. The MPC in Nigeria was out to look for better monetary policy that could curtail the obvious effect that may result from the shutdown of the nation's economy.

In the light of this effort, the Nigerian economy is yet to recover from the pandemic shock and businesses were just trying to break-even. Therefore, this paper is set to evaluate the effectiveness of these monetary policy instruments that were put in place to motivate growth in the economy within the COVID-19 period, knowing fully well that Nigeria is an emerging economy. Specifically, the study intend to examine the impact of three most used instruments of monetary policy: exchange rate; monetary policy rate; and broad money supply, on economic growth in Nigeria.

This paper is structured in the following order; Introduction, Literature Review, Methodology, Discussion of Findings, Conclusion and Recommendations.

## **2. Literature Review**

### *Conceptual Issues*

Economic policy is majorly divided into two; namely Monetary and Fiscal Policies. While fiscal policy is concerned with regulation of non monetary issues (tax, budget, terms of trade, etc) that affect the economy, monetary policy on the other hand is concerned mostly with combination of measures (tools or instruments) which is used collectively or selectively to control the supply of money and credit flow in any economy. The application of this policy – monetary – may take the form of expansionary when the MPC want to increase the volume money supply in the economy than accustomed but contractionary form of monetary policy which intends to shrink the volume of money in circulation in order to slow down economic activities so as to curb economic distortions (Freidman, 2001; Okigbo, 2008).

Acha, Ikoh & Nsien (2016) cited Lipsey & Chrystal, (1995) as saying that expansionary is usually used to check unemployment during recession by reducing interest rate hoping that easy access to credit will boom business activities but on the other hand contractionary tools are deploy into the economy to checkmate distortions caused by inflationary tendencies.

Ufoeze, Odimgbe, Ezeabalisi and lajekwu (2018) stated that monetary policy is usually embarked upon in order to control the acceleration of money supply in an economy. Every government desire to have a specific economic growth because it is very much believed that the rate of growth had impacted the purchasing power of economic agents; hence government action plan in the monetary sector is highly needed to cater for the monetary variables that would affect the government general economic policy.

*Theoretical Review*

According to Acha, IkohandNsien (2016), Keynesian school of thought brought the basis for the regulation of economic activities through interventions to keep the economy afloat. It argued that money stock can facilitate financial market activities thus affecting interest rate, investment, output and employment in moving towards full employment of resources. The moment spending is disallowed from the economy, low aggregate demand and contracting of the economy will set in. This is the view of most of the scholars who have argued in favour of the Keynesian principles. Friedman in 1968 argues that if the quantum of money supply is not checked, it may lead the economy into inflation. The consequences of inflation caused by unguided money supply is that it can lead to misallocation of resources, confiscation of wealth, distortion of pricing, raise the cost of doing business and depreciation of money worth (Borio, 1995).

Fischer (1997) suggested that prudent regulation and supervision are fundamental to compliance with monetary policy guidelines; hence calling for constant monitoring, probing, analyzing and enquiring into banks activities and information. It is on this background that Omotola (2013) pointed out that monetary policy realization is constrained by many factors in the existing social structure which comprises of security, corruption, goods hoarding and hedging, etc. saying that all put together have impacted negatively on the real sector of the economy thereby exposing the nation to import influenced inflation and shocks from external commodity consumed locally.

Therefore, Chuku (2009) states that the Keynesian IS – LM framework which is usually super imposed on Philip's curve is used to establish inflation and that changes in monetary policy affects the money supply, causing interest rate to send the demand and supply into equilibrium. Also, the classical quantity theory of money which is the Keynes school take to be money supply is believed that through its transmission display indirect effect on Gross Domestic Product (GDP). So, the monetarist agrees with Keynes that economy cannot operate at full employment of resources in the short run and expansionary monetary policy may work positively in the long run.

*Empirical Review*

Borio (2020) emphasized that prudential policy must be entrenched in the financial system in order to encourage the banks to ease capital buffers accumulation so as to keep credit flowing. Capital buffer implies amount of capital above regulatory minima. However, the implication of this capital buffer is that it will ease capital and liquidity requirements, impose blanket distribution restrictions like dividends and ease both classification exposures e.g. non – performing loans, regulatory treatment of accounting losses as well as new expected credit loss provision standard. The basic modification of approach shows three effects; every stakeholder must play its role to tackle the emergency of COVID – 19, to focus on a more micro-prudential approach and safety of individual banks existence.

Jerome (2020) stated that, the outbreak of COVID – 19 caused havoc on human and economic activities across the globe. Public health measures put in place to



check the spread of the virus enhanced sharp decline in economic activities as well as surge in job losses, weak demand, low oil prices all combined to low credit flow into households and Businesses in US and the world at large. Equity prices and nominal treasury dropped sharply causing functioning market deterioration and making all markets experience acute strains. This necessitated the Federal Reserve to bring into the economy interventions that can restore smooth market functioning like emergency credit and liquidity facilities. In the end, adjustments were made to the supervisory and regulatory role to facilitate market functioning and reduction of regulatory impediments to banks assisting economic agents in the US.

World Bank Group (2020), in an effort to discuss the Financial Sector Policy Interventions–Liquidity Support and Risk Mitigation expressed concerns as to how to bridge the financial gap created by COVID–19, financial sector vulnerabilities of the emerging markets like the Western Balkans whose financial system is fragile and financial stability risk of the region. Four major risks are likely to emerge in the event of COVID–19; market risk, liquidity risk, credit risk and risk to earnings and resilience. It is however noted that unusual monetary policy needs to be deployed in all effort to reduce the unforeseen effect of the pandemic on the economy. This is sometimes called discretionary monetary policy.

Macroeconomic outlook resulting from the effect of the pandemic is dependent on monetary policy choice of action. The major concern of the financial authorities should be, to set the funds rate to keep inflation and unemployment in control. It is this understanding that makes some countries in Europe to adopt policy rate below zero and in US close to zero. It has become pertinent that when a country reaches it lower bound, the financial situation should not be allowed to worsen further hence policymakers must act swiftly rather than waiting for the doom. Flexible policy option must be adapted in relation to the peculiarity of every country’s inflation and unemployment propensities (Curdia, 2020).

Pinshi and Malata (May, 2020) in the study fading the effect of corona virus with monetary policy found that there were many factor that could affect the economy from the pandemic uncertainty. The Bayesian Technique of the VAR model used, shows that cutting the policy rate would not help the economy to cope with the corollaries of COVID – 19. The study suggests that there is need to rethink other tactics and strategies that would prevent communication gap and evolve unconditional monetary policy measures. Furthermore, it was noted that fiscal policy could be a key driver in blurring the effects of the corona virus crisis.

Nikola (2019) argued that it is apparent to see coming of cashless society in the nearest future which would be aided by the central bank’s evolution of digital electronic currencies as it is already happening in countries like Sweden. It is however recommended that financial inclusion, reviewing policy regulation framework as it will affect digital currencies, financial stability and the needed financial infrastructure must be in the front burner of MPC discussions so as to foster better ways of adopting cashless policy in any country.

Ufoeze, Odimgbe, Ezeabalisi and Alajekwu (2018) carry out study on the effect of monetary policy on economic growth. The study which covers a period of 30 years

used ordinary least square technique and revealed that monetary policy rate, interest rate and investment are not significant to economic growth while money supply and exchange rate were significant in Nigeria. Their study, however, used GDP as proxy in place of the growth in GDP, which could not be the best for the study. Secondly, they employed multiple regressions which measure the immediate impact of the relationship. It is a known fact that economic variables do not impact until after some times lag, and is informed that the method used might not be accurate. Lastly on this part of the paper, monetary policy and its effectiveness on economic development in Nigeria reveals that monetary policy is pivotal in the creation of favourable investment climate which can stimulate both exchange and interest rates that would in the end attract local and foreign direct investment, job creation and diversification of the economy (Akinjare, Babajide, Isibor & Okofofor, 2016). The study used OLS to carry the empirical investigation that shows that exchange rate, interest rate and monetary rate are positively related to economic development in Nigeria.

Fasanya, Onakoya and Agboluaje (2013) have examined the impact of monetary policy on economic growth in Nigeria. The study used time-series data covering the range of 1975 to 2010. The effects of stochastic shocks of each of the endogenous variables are explored using Error Correction Model (ECM). The study showed that long-run relationship exists among the variables. In addition, the core finding of this study showed that inflation rate, exchange rate and external reserve are significant monetary policy instruments that drive growth in Nigeria.

Adegbite and Alabi (2013) examined the impact of monetary policy on economic growth in Nigeria, using secondary data from central bank of Nigeria statistical bulletin covering the period of 1970 to 2010. Multiple regressions were employed to analyze data on such variable money supplies; inflation, exchange rate, interest rate and gross domestic product were all found to have significant effects on the Economics Growth with the Adjusted  $R^2$  of 58%. Following the outcome of this study, it is, therefore, concluded that exchange rate stability had played an important key role in keeping inflation low for most of the transition period. This paper has so many issues, from spurious analysis to misspecification. Also there was no room for lag period.

#### *The Gap in Literature*

Most papers written prior to this study but within this COVID-19 period such as those of Borio (2020), Jerome (2020), World Bank Group (2020), Curdia (2020) and Pinshi and Malata (2020) could not look into the effectiveness of monetary policy during the COVID-19 era. Studies before this era based their investigations on era without the pandemic. Therefore, to the best of our knowledge, research has not been carried out to address this topic during the present pandemic and this is the main gap this study tries to fill.

### **3. Methodology**

This study adapted the model of Ufoeze, Odimgbe, Ezeabalisi and Alajekwu (2018). Thus, the study specified growth rate as the dependent variables, while monetary policy is represented by the most commonly used instruments of

monetary policy during the COVID-19 pandemic: monetary policy rate; exchange rate and broad money supply, remained the explanatory variable. This is presented in equation 1 as:

$$G_r = f(M_{pr}, E_r, M_s) \dots\dots\dots 1$$

Where  $G_r$  is the growth rate of gross domestic product,  $M_{pr}$  stands for monetary policy rate,  $E_r$  is exchange rate of naira to the US dollar and  $M_s$  is broad money supply in Nigeria.

In this regard, the econometric model becomes

$$G_r = \alpha + \beta_1 M_{pr} + \beta_2 E_r + \beta_3 M_s + \mu_t \dots\dots\dots 2$$

Where  $\mu_t$  represents the stochastic error term at present time

*Data Issues*

In measuring the effectiveness of monetary policy on economic growth amidst the pandemic, economic growth, which is usually gotten from change in GDP, was employed and gotten from National Bureau of Statistics (NBS) and Central Bank of Nigeria (CBN) online site. Monetary policy instruments are quite many and often used. However, for this study, we employed only the main instruments that were used during this pandemic according to International Monetary Fund ([IMF], 2020), which are monetary policy rate, exchange rate and indirect pumping of money in form of intervention scheme, which translated to expansion in broad money supply in discretionary form, and the exchange rate which was devalued many times and that has affected the nations exchange rate in real terms. To really examine this impact, weekly data was sourced from NBS and CBN within the period of the global attack, December 2019 to October 2020. The choice of October Due to the small size of observation, data set was transformed to weekly data to give forty-eight observations in all.

The Bureau de change exchange rate of United States dollars to the Nigerian naira was employed to cater for the actual exchange rate not managed by the government, and it was sourced from the Central Bank of Nigeria online data base as well.

*Estimation Procedure*

After taking the natural log of the explanatory variables in question, a descriptive and correlation statistics were analysed. Pre-estimation technique using unit roots were employed which informed the study to use the Vector Auto-Regressive (VAR)/Vector Error Correction Mechanism (VEC) techniques. Forecasted variance decomposition was also used to diagnose the causes of variation, and then finally, post-estimation test was carried out using the VEC stability test.

**4. Results**

Table 1 showcases the descriptive statistics of the dataset with 48 observations. The table shows that Money Supply (Ms), have the highest mean followed by Exchange Rate(Er), Monetary Policy rate (Mpr) and Growth rate (Gr) respectively. Skewness is the measure of asymmetry of the data around its mean; the four variables are all

negatively skewed i.e the data has a long left tail. Standard deviation show rate of volatility of the dataset.

The Kurtosis shows that all the variables are less than 3 i.e. platykurtic distribution meaning the distribution is flat relative to normal. The Jarque-Bera shows normality distribution of data. The high Jarque-Bera probability above 0.05% as shown in the table means acceptance of the null hypothesis that the variables are normally distributed, except Er.

Table 1: Descriptive Statistics

	Gr	Er	M2	Mpr
Mean	-0.5566	419.4906	32153062	12.79167
Median	-1.76	443.8900	32593522	12.50000
Maximum	2.550000	473.4800	35690619	13.50000
Minimum	-3.62	359.0000	28783194	11.50000
Std. Dev.	2.454741	44.94398	2235746.	0.742576
Skewness	-0.03	-0.32	-0.09	-0.51
Kurtosis	1.29	1.37	1.82	1.99
Jarque-Bera	5.81	6.15	2.82	4.16
Probability	0.05	0.04	0.24	0.12
Sum	-26.72	20135.55	1.54E+09	614.0000
Sum Sq. Dev.	283.2105	94938.20	2.35E+14	25.91667
Observations	48	48	48	48

*Source: Author's extract from Computation of E-Views 9.0.*

Table 2 shows the correlation matrix and its probability of the relationship between the variables. Er and Ms show a negative relationship with Gr while Mpr shows positive relationship with Gr. they are all significant at 1% level of significance, as indicated by their respective probabilities.

Table 2: Correlation Matrix

Correlation Probability	GR	ER	M2	MPR
GR	1.0000			
ER	-0.8374	1.0000		
M2	-0.6784	0.9286	1.0000	
MPR	0.5384	-0.8155	-0.9027	1.0000

*Source: Author's extract from Computation of E-Views 9.0.*

The table below shows the summary of the Augmented Dickey-Fuller (ADF), Levin, Lin & Chu t\*, Im, Pesaran and Shin W-stat and Phillip Peron (PP) unit root tests used. The four results shows that all the variables are not stationary at level, but are stationary at 1<sup>st</sup> difference; this is an indication that the VAR method will be more desirable for the analysis.

Table 3: Unit Root Test

	At level	Probability	At 1 <sup>st</sup> difference	Probability	Remark
Levin, Lin & Chu t*	-0.0615	0.4755	-8.6730	0.0000	1(1)
Im, Pesaran and Shin W-stat	1.6136	0.9467	-9.0472	0.0000	1(1)
ADF-Fisher Chi-square	2.3359	0.9689	63.1602	0.0000	1(1)
PP-Fisher Chi-square	2.2988	0.9705	74.4794	0.0000	1(1)

Source: Author's extract from Computation of E-Views 9.0.

Trend Analysis

The graph of the trend of Money Supply(M2), Exchange Rate(Er), Monetary Policy rate(Mpr) are Growth rate (Gr) in Nigeria is shown in figure 1 below; the Y-axis shows the rates while the X- axis shows the month.

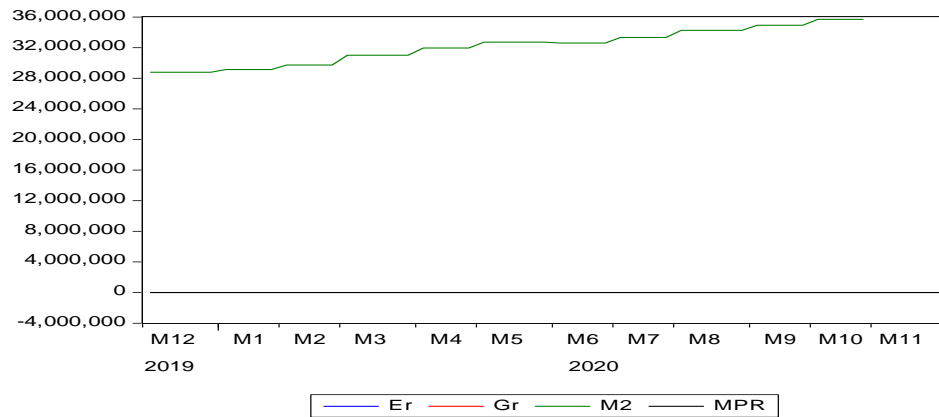


Figure 1: Trend Analysis

Table 4 is the presentation of the lag selection criteria. The optimal lag length of 2 is selected based on consequential modified LR test statistic, Final prediction error (FPE), Akaike information criterion (AIC), Schwarz information criterion (SC) and Hannan-Quinn information criterion (HQ).

Table 4: Result of Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1014.308	NA	1.99e+14	44.27427	44.43328	44.33383
1	-837.4199	315.3224*	1.83e+11*	37.27913*	38.07419*	37.57696*
2	-833.4149	6.442903	3.13e+11	37.80065	39.23176	38.33675

Note: \* indicates lag order selected by the criterion; LR: sequential modified LR test statistic (each test at 5% level); FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion

Result on Table 5, using the trace statistics, indicates that there exist cointegrating equations at 5% significant level. Hence the null hypothesis of no cointegration equation is rejected using the MacKinnon-Haug-Michelis (1999) p-values.

Table 5: Cointegration Rank Test (Trace) Results

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.546593	72.77651	47.85613	0.0001
At most 1*	0.250000	37.97403	29.79707	0.0046
At most 2*	0.250000	25.31602	15.49471	0.0012
At most 3*	0.250000	12.65801	3.841466	0.0004

Source: Author's Computation

The Max-Eigen value result on Table 6 also shows that there exist cointegrating equations at 5% significant level. Hence the null hypothesis of no cointegration equation is rejected using the MacKinnon-Haug-Michelis (1999) p-values. Both results on Tables 5 and 6 indicate the existence of long run cointegration and hence long run relationship. This informed the error correction model.

Table 6: Cointegration Rank Test (Maximum Eigenvalue) Results

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.515763	32.63317	27.58434	0.0103
At most 1	0.333333	18.24593	21.13162	0.1209
At most 2 *	0.333333	18.24593	14.26460	0.0111
At most 3 *	0.333333	18.24593	3.841466	0.0000

Source: Author's Computation

Table 7 shows the result of the long run cointegration. From the result, the coefficients of Exchange Rate and Monetary policy rate show that they both have positive long run effect on Growth rate while Money supply (M2) has a negative impact on the long run meaning that an increase in Exchange rate and Monetary policy rate will invariably lead to an increase in growth rate while an increase in Money supply will lead to a decrease in Growth. More so, Exchange rate and Monetary policy rate have significant impact in the long run because their t-statistics values were above 2 except for Money supply which does not have.

Table 7: VEC Estimates – Result of Longrun cointegration Equation

Variables	Coefficient	Standard Error	t-statistics
GR(-1)	1.000000		
ER(-1)	0.097598	0.02386	4.09119
M2(-1)	-1.05E-08	6.4E-07	-0.01636
MPR(-1)	4.060950	1.26127	3.21973

Source: Author's Computation

Table 8 presents the short run impact and error correction mechanism (ECM) of the model at lag 1. The coefficient of ECM (-0.311757) shows a negative sign which indicates that 31% of the disequilibrium is corrected in each week. It is also significant because the t-statistics is more than 2. Like the long run coefficient table above, ER and MPR has positive short run on GR while M2 has a negative short

run impact but, they are all not significant in the short run as their individual t-statistics are all less than 2.

Table 8: Result of Error Correction Mechanism

Variables	Coefficient	Standard Error	t-statistics
ECM	-0.311757	0.09278	-3.36029
D(GR(-1))	0.078998	0.16076	0.49139
D(ER(-1))	0.028388	0.02517	1.12800
D(M2(-1))	-1.79E-07	6.1E-07	-0.29657
D(MPR(-1))	0.677149	0.78451	0.86315
R-squared	0.220227		
Adj. R-squared	0.122755		
F-statistic	2.259396		

Source: Author's Computation

Figure 2 below shows the graphical representation of the VAR stability check result. When the dots are outside the circle, the VAR is said to be unstable but if otherwise, it is stable (Asterious & Hall, 2007). The figure signifies that the VAR satisfies the stability condition check since the dots are located within the circle.

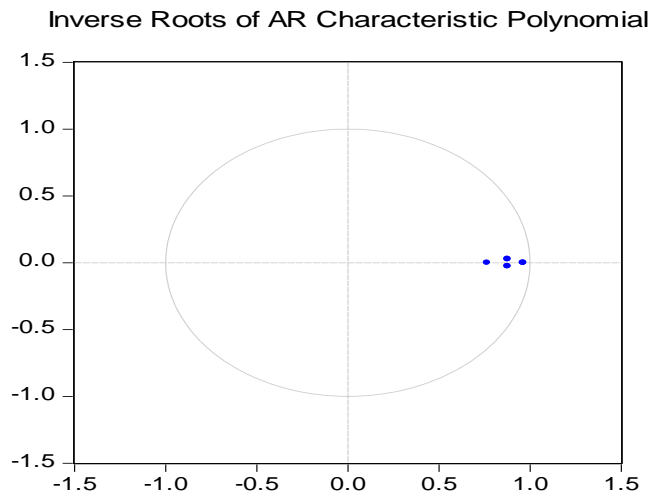


Figure 2: VAR Stability Check

From the result of variance decomposition for 10 periods, on Table 9, it reveals that in the first 7 days, Growth rate is explained by its own innovative shocks. In the second week (period 2), Monetary policy rate (MPR) explains 3.81% of the variation of shocks in growth rate while exchange rate and money supply are responsible for 2.00% and 0.69% respectively. From the period 3 up to the tenth period, Exchange rate (LER) is responsible for over 5% of variation in growth rate in period 3 up to an increase of above 21% in period 10, while Monetary policy rate in the 3<sup>rd</sup> period stands at 3.81% and 16.17% at 10<sup>th</sup> period. Money Supply on the

other hand contributes 1.83% of variance in growth rate in the third period and increases up to 7.18% in the 10<sup>th</sup> period.

Table 9: Variance Decomposition of GR:

Period	S.E.	GR	LER	LM2	LMPR
1	0.919526	100.0000	0.000000	0.000000	0.000000
2	1.221650	95.89356	2.003984	0.688395	1.414062
3	1.437664	89.03346	5.330138	1.826914	3.809485
4	1.614473	81.65014	8.884001	3.039459	6.426396
5	1.764650	74.90374	12.10418	4.135076	8.857006
6	1.892515	69.19528	14.80266	5.051233	10.95082
7	2.000436	64.54671	16.97580	5.788188	12.68930
8	2.090485	60.83420	18.68944	6.369488	14.10687
9	2.164771	57.89866	20.02513	6.823572	15.25264
10	2.225415	55.58966	21.05894	7.176674	16.17472

*Source: Authors' Computation.*

The results of variance decomposition indicates that exchange rate as an instrument of monetary policy has more power in this regard than the monetary policy rate during this pandemic period.

### 5. Conclusion and Recommendation

This study examined the effectiveness of monetary policy on economic growth in the country within the COVID-19 period, using three most adjusted instruments: the monetary policy rate, the exchange rate and broad money supply, which were made the explanatory variables. The growth rate stood as the dependent variable. It was realized that when applied individually, monetary policy rate and exchange rate granger caused economic growth while broad money supply did not. When jointly used, all three variables granger caused economic growth. Also, It was found that, monetary policy rate and exchange rate have significant impact on economic growth while broad money supply did not have any significant impact.

This study therefore, suggests that, the monetary authorities could use the instruments of monetary policy rate and exchange rate to motivate economic growth amidst pandemic periods like this. More so, pumping out money can only have significant impact when the use of such monies is guided for the intervention purpose only. If not, it could end up causing serious inflation

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## Effect of Covid-19 on Public Transport Commuters' Well-Being in Ilorin Metropolis, Nigeria

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### Abstract

*COVID-19 outbreak is a pandemic that shakes the whole world without exception. The pandemic has caused a lot of activities to stop, with strict restriction on mobility in order to curtail the spread of the virus. The transport sector is one of the most affected sectors in the economy. This study therefore, investigates the impact of COVID-19 Pandemic on public transport commuters' wellbeing in Ilorin metropolis of Kwara State Nigeria through cross-sectional survey technique. Questionnaire was used to 117 respondents who were selected using convenient sampling techniques. PLS-SEM path modeling was employed to process the data. The result revealed that the major determinants of public transport commuter's well-being during the first wave of COVID-19 pandemic in Nigeria are quality of road and transport fare. The study therefore recommended the need for improvement in quality of road by the government and provision of alternative means of transportation like railway for public transport commuters.*

**Keywords:** Commuter, Covid-19, Mobility, Transport, Well-Being

**JEL Classification:** C83, D91, I31, L92

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### 1. Introduction

The outbreak of corona virus also known as COVID-19 shook the world, and left no country unscathed. It left countries in the global north and south scrambling for responses to the unprecedented pandemic in our live time. Initially, the spread of the coronavirus from China across the globe spared the African continent, with zero confirmed cases as of January 2020. However, by 14 February, the region had confirmed the first case in Egypt. Almost nine months later, the number of cases confirmed has increased to approximately 1.6 million, 1.3 million recoveries and more than 38,000 deaths. In Nigeria alone, confirmed cases stood at 60,430, with a total of 51,943 recoveries and 1,115 deaths as at 14 October 2020 (WHO, 2020). While the spread of coronavirus affected many sectors of the economy, its effect is very pronounced in the transportation sector.

As a way of curtailing the spread and fighting the pandemic, many countries and cities adopt measures such as massive restrictions on travels as well as imposed lockdown, except for absolute necessity. In the UK for instance, the government enforced a stay-at-home order, restricting all non-essential travel and closing down almost all schools, businesses, places of worship and gatherings. Nigeria also declared a national lockdown and mobility restriction following suit. As a result, the pandemic struck public transport hard. As public transport is directly related to economic development and dependent on mobility, loss of revenue is most likely unavoidable as a result of travel restrictions. In Brazil, for example, according to the National Association of Urban Transport, mobility restrictions are expected to cost bus operators as much as USD188 million in daily fare losses (International Growth Centre, 2020). While there are no current statistics on loss of revenue, given the serious effects of COVID-19 on the sector, this is expected to be high.

Very peculiar to African countries, Nigeria transportation is largely owned and managed by the private sector. A vast majority of Nigerians rely on privately-operated transportation to get around their daily lives. As such, public transport, in the form of taxis, bus, tricycle and bike has and continues to play a pivotal role in the lives of citizens and since private transit operators are profit-oriented, they charge rates that produce sufficient income to cover all cost, as well as make some profit. This may often suggest unreasonable hiking of transport fares by private transit operators, albeit without any justifiable cause. Prior to the pandemic, there was rising concern over the upsurge in public transportation cost. A study by Wojuade (2017) on public transport pricing in Lagos concludes that transport fares are viewed as high by commuters and do not correspond to services offered by transit operators. The coronavirus pandemic and government regulations to curtail its spread have exacerbated this concern. The nationwide lockdown and movement restriction, coupled with rise in energy prices and instability of the economy is likely to impact adversely on the transit operators. As countries began to ease lockdown and restrictions, it is pertinent to understand its impact on commuters' welfare.

Many researches (Jallow, Renukappa and Suresh, 2020, Loske, 2020 & Katrakazas, Michelaraki, Sekadakis & Yannis, 2020) have been conducted on the effect of COVID-19 on transportation system in the developed countries, studies on this issue is still at infancy stage on countries in the global south, like Nigeria. The few existing studies (Mogaji, 2020 & Ozili, 2020) focus majorly on theoretical underpinnings of the effect of COVID-19 on transportation, there is dearth of empirical evidence in the literature; this study, therefore, attempt to fill the gap in our knowledge, by providing an empirical evidence on the effect of COVID-19 on public transport commuters' welfare. The current effort is to investigate the effect of COVID-19 on public transport commuter's well-being in Ilorin Metropolis of Kwara state, Nigeria.

This paper proceeds as follows. Section two provides a review of the literature on transportation, Section three provides the methodology used, while section four presents and discusses findings. The final chapter concludes this paper.

## **2. Literature Review**

Transport is an important instrument for social and economic development, and a tool for integration of Nigeria (Aderamo & Salau, 2020). It is evident that urbanization relies intensely on transport facilities in a country, as it links origins and destinations. As documented by Aderamo and Salau (2013), movement of passengers and goods are achieved mainly by roads, via rail ways and inland water ways (although they play less important roles). The most dominant means of transportation in Nigeria is car (Aderamo & Salau, 2013).

Transport facility is one of the most important elements that determine industrial growth and development in any country, Nigeria to be specific (Oni & Okanlawon, 2006). Oni and Okanlawon, (2006) further asserted that poor provision of transport infrastructure accounts for the incidence of poverty across various Nigerian communities in both urban and rural areas. Public transport constitutes the largest share of mobility of goods and commuters in Nigeria, and mainly conducted by road through cars and buses.

### *Determinants of Travel Well-being*

In literature, the determinants of life satisfaction can be categorized into two which include travel characteristics and personal information (Singleton, 2017). The travel characteristics involve majorly the quality of service while the personal characteristics involve the socio-economic information of transport commuters such as gender, income, education and so on.

Quality of service has been found to have great effect on satisfaction of public transport commuters (De Vos, Schwanen, Van Acker & Witlox, 2013). The quality of service variables includes transport fare, punctuality, speed, proximity, cleanliness and so on. Other studies concluded that travel time and travel duration exerts influence on the satisfaction of commuters with divergence results (Stutzer & Frey, 2008, Morris 2015, & Smith, 2017). Specifically, Morris (2015) found a positive relationship between travel time and satisfaction, while, Smith (2017) found inverse link between satisfaction and longer journey (Smith, 2017).

### *COVID-19 and Transport*

Jallow, Renukappa and Suresh (2020), explored the impact of COVID-19 on infrastructural sector in the United Kingdom, using thematic analysis to determine their results. Their outcome revealed that, the imposed lockdown has made it difficult to carry out projects, especially those that require physical attendance. It was more challenging for managers to manage their teams as a result of the lockdown. However, online communication platforms turned out to be more effective in communication with project teams. Also, induction of new starters proved more challenging, as it involves some certain tests.

Loske (2020) examined the link between transport volume and the number of COVID-19 infection per-day in Germany. The result of the empirical analysis for Germany retail food statistics shows that the change of freight volume does not depend on covid-19 pandemic. The study however, showed that the freight volume depends on the strength quantification through the aggregate number of fresh infection per day. Katrakazas *et al.*, (2020) considered the effect of COVID-19

pandemic on driving behaviour and road safety in Greece and Kingdom of Saudi-Arabia using descriptive statistics. They discovered that the reduction in traffic volume due to lockdown led to a slight increase in speed per kilometer and reduction of accidents especially at the early hours of the day.

In Nigeria, Mogaji (2020) studied the impact of COVID-19 on transport in Lagos metropolis, using descriptive and One-Way ANOVA as the method of analysis. His findings revealed that there is no notable difference between the impact of COVID-19 on transport and the impact of COVID-19 on economic, social and religious activities. However, most of the respondents were female, within the range of 18-35 years, who were essentially engaged in sales and rendering of essential goods and services.

Ozili (2020) used descriptive analysis to examine the effect of COVID-19 on the Nigerian economy and the structural causes that worsen the COVID-19 pandemic. Findings from the study showed that the economic downfall by the dwindling oil prices accompanied by spillovers of the COVID-19 outbreak, led to a fall in demand for oil produce as well as economic activities, due to the social distancing policies.

#### *Theoretical Framework*

In the literature the study on travel behaviour had been conducted within the purview of utility theory, experienced utility and subjective well-being (SWB) theory (DeVos et.al. 2015) . The Utility theory describes the consumer as a rational individual who based his choice decision on maximization of satisfaction derived from a commodity. It is otherwise known as decision utility (De Vos et. al, 2015).

According to Bentham (1789) cited in De Vos et.al 2015 experienced utility describes the pleasure and pain of consumers. This simply means that experience utility measures the emotions of consumer in consumption of a particular commodity. The experienced utility is very similar to the social well-being theory. This is because the SWB theory measures how individuals are satisfied with their life experiences ( De, Vos et.al 2015 &Chatterjee, et. al. 2019). The SWB also measures the achievement of individual. Hence, The SWB covers three main aspect of human well-being which includes: Positive emotions, negative effect and cognitive evaluation.

Therefore, the social well-being theory is the underpinning theory adopted to investigate the effect of COVID-19 on transport commuters' well-being.

#### *The Conceptual Framework*

This section explained the schematic link of the determinants of well-being. Adapting the determinants of well-being from previous study the conceptual framework for this study is shown in figure 1

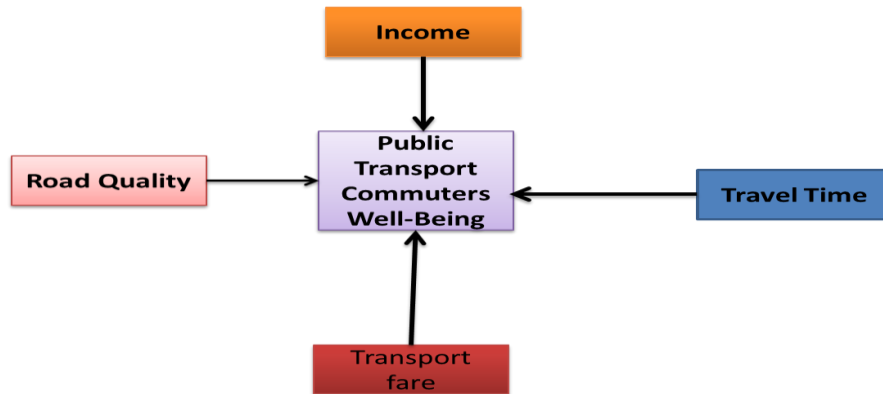


Figure1: Schematic link of Public transport commuters' well-being.

Source: Authors' Report, 2020

### 3. Methodology

In studying the effect of COVID-19 on the welfare of public transport commuters in Ilorin west local government, the study used primary data set which was gotten through a structured questionnaire designed with Google form and administered randomly with convenient sampling technique via email and WhatsApp platforms. This method of sampling technique was adopted, due to the contagious nature of COVID-19, which necessitate great caution for physical contact. Respondents were however, requested to fill their local government in order to guide the geographical scope of the study. A total of 117 samples, which were from Ilorin metropolis were retrieved via the google form for the study.

To measure well-being of transport commuters, the study adapted the satisfaction travel scale items from Smith (2017) and Singleton (2017). The items were divided into three: Positive deactivation, Positive activation and Cognitive evaluation. The study used descriptive statistics, confirmatory factor analysis, and structural equation modeling to analyze the results of the survey. The Structural Equation Modeling is an extension of linear model. It is a graphical interface that displays the relationship of the items in the model. One major advantage of structural equation model is that it provides the overall test model fit, as well as individual parameter estimates simultaneously.

The determinants on well-being include income of public transport commuters, travel time, transport fare and road quality as explained earlier under the literature review. The model is specified using a structural modeling method as shown in figure 2:

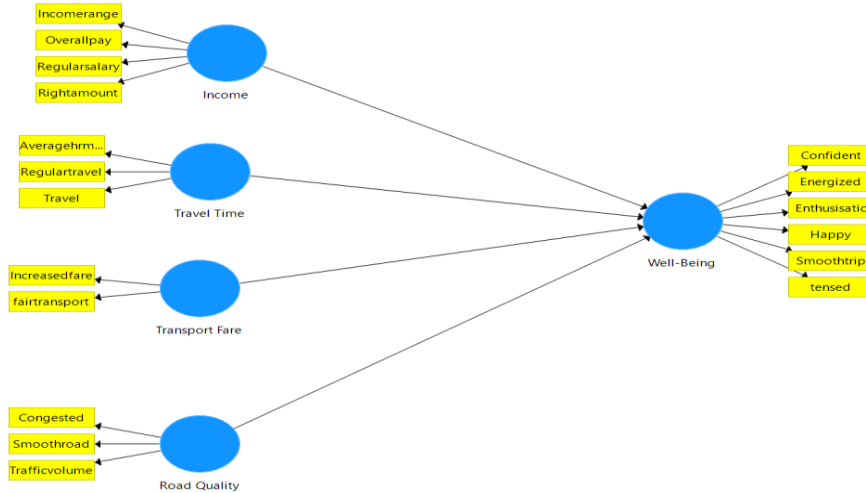


Figure 2: Transport Commuter's Well-Being Model  
 Source: Authors' Report, 2020

4. Results

Socio-Demographic Characteristics of the Respondent

The socio-demographic characteristics of the respondents are presented in table 1. This includes gender, age, level of education and occupation. The table indicates that out of 117 respondents 54 (46.2 per cent) are males while 63 (53.8 per cent) were females. It also indicates that the age bracket between 18 and 20 years as well

Table 1: Socio Demographic Characteristics of the Respondents

		Frequency	Percent	Mean
Gender	Male	54	46.2	0.461538
	Female	63	53.8	0.538462
Age	18-20	24	20.5	0.205128
	21-30	24	20.5	0.205128
	31-40	36	30.8	0.307692
	Above 40	33	28.2	0.282051
Education	SSCE	3	2.6	0.025641
Level	ND/NCE	6	5.1	0.051282
	B.Sc/B.ED/B.A	90	76.9	0.769231
	Masters/PGD	9	7.7	0.076923
	Ph.D	9	7.7	0.076923
Occupation	Unemployed	32	27.4	0.273504
	Self-Employed	13	11.1	0.111111
	Civil-Sevant	56	47.9	0.478632
	Private-Servant	12	10.3	0.102564
	Pensioner	4	3.4	0.034188

Source: Authors' Computation, 2020



as 21 and 30 years constitute 20.5 per cent of the respondents respectively while highest age brackets of the respondent falls between the age group of 31 and 40 years. Looking at the education level the highest qualification of the majority of the respondents (76.9 per cent) is the first degree (B.Sc./B.Ed./B.A). This may be as a result of the method used in gathering the data set which was through the used Google forms, e-mails and social platforms. In addition, the table also shows that majority of the respondents are civil servants with a percentage of 47.9.

*Descriptive Statistics of the Measurement Instruments*

The descriptive statistics of the measurement instrument is presented in table 2. The results show that the average scores of the instruments ranges between 2.259 and 4.385 on the 1-5 Likert-scale. Majority of the instruments fall above the average mean score of 3.14, which imply that most of the respondents agreed with most of the instruments with moderate dispersion. After due screening of the data set, the values under kurtosis range between -2.1 and +2.0 with the exception of two instruments (Energized and Increasedfare). However, the skewness ranges between -1 and +1

**Table 2: Descriptive Statistics of the Measurement Instruments**

S/N	Measurement Variable	Mean	Standard Deviation	Kurtosis	Skewness
1	Incomerange	2.259	1.328	-1.740	0.277
2	Regularsalary	3.349	1.221	-1.091	-0.132
3	Rightamount	3.402	1.285	-1.265	-0.201
4	Overallpay	3.098	1.287	-1.095	0.430
5	Regulartravel	3.129	1.157	-1.076	0.633
6	Nottravel	3.571	1.208	-0.615	-0.480
7	Destination	4.056	1.026	-0.679	-0.739
8	Increasedfare	4.385	0.977	2.999	-1.843
9	Fairtransport	3.305	0.959	-0.022	-0.060
10	Happy	3.789	1.080	-0.154	-0.840
11	Energized	3.863	0.856	3.136	-1.303
12	Enthusiastic	3.744	0.775	0.111	-0.519
13	Tensed	3.500	0.881	-0.691	-0.234
14	Smoothtrip	3.557	0.906	-0.656	-0.491
15	Confident	3.575	1.029	-1.066	-0.304
16	Congested	3.659	1.133	-1.442	-0.082
17	Smoothroad	3.363	1.048	-0.820	-0.214
18	Trafficvolume	3.532	1.112	-0.444	-0.560

*Source: Authors' Computation, 2020*

*Measurement Model*

The factor loadings of the constructs for the measurement model are presented in Table 3. All the factor loadings for the constructs were greater than 0.5 except travel time which was very low (0.019). The travel time construct was subsequently removed because all other statistic justifies its removal. For the measurement model evaluation, the study adopts the reliability and Validity tests statistics as well as discriminant statistic to test the reliability of the constructs. The reliability of the construct was tested using Cronbach's Alpha, composite reliability and

convergence reliability which are presented in Table 3. The cronbach’s Alpha for all the constructs is between 0.5 and 0.9 while the composite reliability is greater than 0.7 for all the constructs.

The Discriminants reliability test was based on two major statistics methods of evaluation which are Fornel-Lacker Criterion and Hetrotrait-Montrait Ratio (HTMT). Both of them are presented in Table 2 and Table 3 respectively.

**Table 3: Factor Loadings, Reliability and Validity**

Indicator	Factor Loadings	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Overallpay	0.954	0.933	0.953	0.871
Regularsalary	0.951			
Rightamount	0.894			
Increasedfare	0.647	0.503	0.78	0.647
Fairtransport	0.936			
Smoothroad	0.865	0.626	0.79	0.56
Congested	0.639			
Trafficvolume	0.723			
Tensed	0.647	0.784	0.847	0.484
Enthusiastic	0.577			
Happy	0.669			
Energized	0.678			
Confident	0.833			
Smoothtrip	0.742			

*Source: Authors’ Computation, 2020*

**Table 4: Fornel- Larker Criteria**

	Income	Road Quality	Transport fare	Well-Being
Income	0.933			
Road Quality	0.059	0.748		
Transport fare	0.308	0.43	0.804	
Well-Being	0.055	0.648	0.44	0.696

*Source: Authors’ Computation, 2020*

**Table 5: HTM Criteria**

	Income	Road Quality	Transport fare	Well-Being
Income				
Road Quality	0.21			
Transport fare	0.344	0.717		
Well-Being	0.117	0.836	0.677	

*Source: Authors’ Computation, 2020*

**Bootstrapping Analysis**

The bootstrapping analysis was carried out to determine the direct contribution of the determinants of public transport commuters’ well-being in Ilorin Metropolis of kwara state, Nigeria. The bootstrapping was conducted by using 5,000 subsamples for 117 cases. The bootstrapping result is presented in figure 3, and it indicates that the magnitude and significance of the structural paths are consistent.

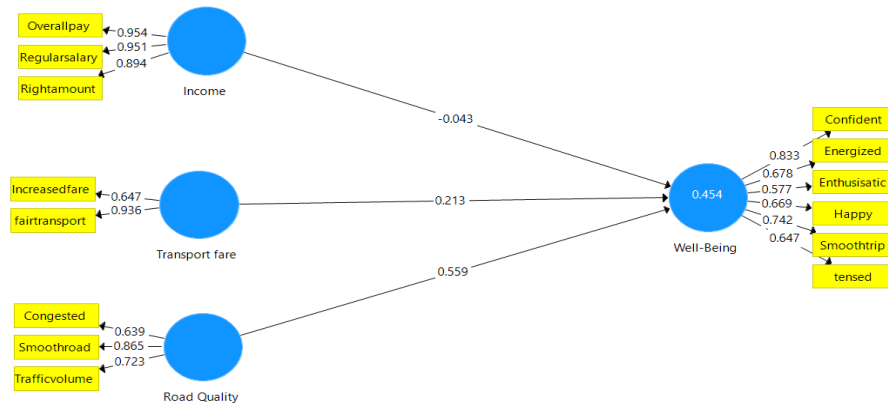


Figure 3: Bootstrapping Analysis  
 Source: Authors' Computation, 2020

Path Coefficient

Table 6 presents the path coefficient of the model which indicates the Beta Value, Standard Error, T-Statistic, P-Values, R Square and Q Square.

Table 6: Path Coefficient

	Beta Value	Standard Errors	T Statistics	P Values
Income -> Well-Being	-0.043	0.075	0.573	0.567
Road Quality -> Well-Being	0.559	0.062	9.046	0.000**
Transport Fare -> Well-Being	0.213	0.089	2.398	0.017**
	R <sup>2</sup>	Q <sup>2</sup>		
	0.483	0.217		

Note: P value \*\* < 0.05

Source: Authors' Computation, 2020

The structural model is presented in Table 6, The result indicates that income exhibits an insignificant negative effect on well-being using both p-value (0.567) and t-Statistic (0.573) while road quality constructs(P= 0.000, t = 9.046) shows a significant positive impact on transport commuters well-being during the covid-19 pandemic. In addition the model also reveals that transport fare (P=0.017 & t = 2.398) exerts significant impact on well-being of transport commuters during the COVID -19 pandemic.This corroborates the study of Morris (2015), which found positive relationship between travel time and well-being. The goodness of fit of the model is determined by R<sup>2</sup>, Q<sup>2</sup> and SMR. The R<sup>2</sup> result is 0.483 which is above 0.1 thus, simply means that, the predictive capability of the model is established. The Q<sup>2</sup> (0.217) also corroborates the predictive relevance of the endogenous variable because it is greater than zero.

### 5. Conclusion and Recommendation

The study investigated the effect of COVID-19 on public transport commuters' well-being in Ilorin metropolis of Kwara state, Nigeria. Based on the previous studies, this study adapted constructs for public transport commuters' wellbeing determinants. The data was analysed using structural equation model. The results revealed that the quality of road and transport fare exert significant effect on wellbeing. The study concluded that the major determinants of wellbeing of public transport commuters' during COVID-19 Pandemic in Ilorin metropolis, Nigeria are quality of road and transport fare. Therefore, the study recommends that there is need for improvement in the quality of road in the country which is the major means of transportation by public transport commuters'. Also to put a check on transport fare, provision of affordable alternative means of transportation such as railway should be made accessible for public transport commuters. This will go along way to reduce excessive increase in transport fare through competition.

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## **Impacts of Covid-19 on Socio-Economic Characteristics of Households in Kano, Nigeria**

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### **Abstract**

*One of the pandemics that affected the entire world in recent times is the COVID-19 pandemic. The impact of the COVID-19 epidemic on socio-economic activities is ruinous and can even be more cataclysmic when COVID-19 combines with other existing social and economic challenges in any society. The purpose of the study is to assess the impacts of the COVID-19 pandemic on households' socio-economic activities in Kano, Nigeria. A location that is already facing severe challenges in terms of high poverty rate, unemployment, and other social and economic difficulties. The study used a primary source of data, collected among a sample of 426 respondents that constitute household heads drawn from the three (3) regions in Kano using stratification method involving four stages. Descriptive analysis was used to analyze the data collected from the respondents. Findings revealed that COVID-19 pandemic had significant negative impacts on socio-economic activities of the households in Kano. The finding indicates that a large number of household's respondents have divergent views of whether COVID-19 is real or fake, despite a broader awareness concerning the virus and preventive measures against the virus. COVID-19 pandemic has exposed government effort in the healthcare system in the study area. Besides government measures related to socio-economic to assist poorest in society that suffered from the loss of income during the imposed lockdown through palliative has been marred with a lot of irregularities.*

**Keywords:** COVID-19, Kano, Poverty, Lockdown, Palliative

**JEL Classification:** I32

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### **1. Introduction**

The impacts of Corona Virus Disease 2019 (COVID-19) pandemic on socio-economic variables is shaping up into catastrophic unless something drastic is put in place to control the wide spread of the pandemic in the world. For instance, according to a recent World Bank report, COVID-19 impact has pushed more than 70 million additional people into extreme poverty by the end of June 2020 from the initial pre-COVID-19 figure of 595 million individuals globally (Mahler, Lakner, Aguila & Wu, 2020). The report viewed the number of people pushed into extreme poverty under two (2) different scenarios, namely the baseline projection and the

downside projection. The projection under the baseline presumes that the pandemic will be stationary or remains at an expected level. In contrast, activities are expected to pick up before the end of the year. Subsequently, using the International Poverty Line (IPL) of US\$1.90 daily, the projection estimated more than 70 million individuals to be destitute (Mahler et al., 2020).

On the other hand, the downside projection assumed the pandemic to persevere for a more extended period than expected thereby forcing the maintenance or lockdown conditions to continue or to resurface again, which will subsequently result in exposed businesses to quit and a sharp decline in vulnerable household's consumption (Mahler et al., 2020). At the same time, financial stress would immediately set in among the low-income and middle-income nations of the world (Mahler et al., 2020). While an estimated 71 million people are expected to be pushed into extreme poverty under the baseline projection that of downside projection estimated about 100 million people. This, therefore, translate into global economic growth contraction of 5% under baseline projection and 8% under the downside projection (Mahler et al., 2020).

Lakner, Mahler, Negre and Prydz (2020) stresses that uncertainty is eminent in 2021 and beyond, even with the expected increase in global economic productivity estimated at 4% due to COVID-19 pandemic. Poverty estimates show that there would be no changes between the number of people in extreme poverty in 2020 and 2021 majorly due to the growth rates in countries that warehouse more than one-third of the world's poorest like Nigeria, India and the Democratic Republic of Congo (Lakner et al., 2020). The predicted per capita Gross Domestic Product (GDP) in the three countries are estimated at -0.8%, 2.1% and 0.3%, while the rate of population growth is 2.6%, 1% and 3.1% respectively (Mahler et al., 2020; Lakner et al., 2020). Subsequently, COVID-19 pandemic had cast doubt, as to whether the world would achieve one of the Sustainable Development Goals (SDGs) which is eradicating or reducing the level of extreme poverty by 3% in the world by the year 2030 (Lakner et al., 2020; Sumner, Hoy & Ortiz-Juarez, 2020).

COVID-19 is an Acute Respiratory disease associated with  $\beta$ -coronavirus, also known as Coronavirus-2 (SARS-CoV-2). The origin of the virus can be traced to Wuhan in Hubei province, China in December 2019, when cases of Pneumonia was reported by the World Health Organization (WHO), which has a link to the food system (Zhu et al., 2020). The Chinese Centre for Disease Control (CDC) subsequently identified the pathogen of COVID-19 from the affected patient's swab sample test (Xi et al., 2020). Despite the outstanding effort put in place by the Chinese government to contain the COVID-19 from further escalating in the world revealed that by February 15th, 2020, an estimated 68,584 people were infected by the virus. Presently, as of November 11th, 2020, there was an estimated reported confirmed case of over 51 million infections in the world with over one million deaths. America alone accounts for around 43percent of the global confirmed cases and 52% of confirmed death of COVID-19. United State of America (USA), India and Brazil recorded over 47% of the total global confirmed cases and over 41% of the global death (European Center for Disease Prevention and Control [ECDC], 2020; Johns Hopkins University [JHU], 2020). At the same time, the United States

of America (USA) and Brazil recorded over 10.3million patients and over 240,000 deaths and 5.6 million cases and 162,802 death respectively. On the other hand, Asia has a confirmed case of COVID-19 estimated at over 14.4 million with over 255,858 deaths. India and Iran recorded the highest confirmed cases of COVID-19 in Asia with over 8.6 million and 703,288 patients respectively and fatality rate of 127,571 and 39,202 respectively. Europe recorded a confirmed case of COVID-19 estimated at over 12.8 million and over 305,294 confirmed deaths. On the other hand, Africa has a documented record of over 1.9 million cases of COVID-19 and 45,947 recorded deaths (ECDC,2020; JHU, 2020).

Nigeria in West Africa has a confirmed COVID-19 case recorded as at 11th November 2020 estimated at 64,516 with about 1,162 confirmed deaths and 2,617 active cases out of the samples tested estimated at 687,952 out of over 200 million population (National Centre for Disease Control [NCDC], 2020b). The figure represents only 0.2% of the population tested so far; however, by far among the highest in fatality in West Africa (Sobowale, 2020; Vanguard, 2020). Kano State has an estimated population of about 13 million people, as of 2016, putting into consideration a 2.6% increase annually (National Bureau of Statistics, [NBS], 2017). The State recorded confirmed cases of COVID-19 of 1,756 people and confirmed death estimated at 54 people out of a total tested sample of 46,291 indicating only 0.3% testing capacity of the entire population in the State (NCDC, 2020b). This clearly, revealed the unseriousness the Nigerian government attached toward ending the pandemic. According to WHO (2017), the country's average scores in preventing biological, chemical or radiation is 1.9 across the 15 Joint External Evolution (JEE) indicators, showing a limited capacity. In terms of detecting, the country has an average score of 2.6 out of the 13 indicators, showing some evidence or some level of capabilities to detect new and emerging health risk crisis through surveillance base on real-time as well as laboratory tests. However, sustainability is a challenge in the country. In terms of responding, the country scores an average of 1.5 against 20 indicators, an indication of low capacity to respond to an urgent health crisis.

The country presently has about 2,500 testing capacity daily as at 30th June 2020 an estimated 138,462 individuals were tested against the entire population of 200 million, while in South Africa a country with a total population of 58 million has tested about 3% of its total population against less than 0.3% of Nigeria. In the same vein, before the COVID-19 pandemic, there were about 350 ventilators and 350 Intensive Care Unit (ICU) beds for the total population. By April 2020 the country acquires extra 100 ventilators against an overwhelming case of COVID-19 in the country (Ogunbameru et al., 2020). This clearly, leaves much to be desire in the fight against COVID-19 in Nigeria, which has devastating effects on economic activities in the country (Ibekwe, 2020).

According to the International Monetary Fund (IMF) oil, which is the main export commodity of the country has fallen sharply due to low demand globally due to COVID-19 pandemic. While conflict among the member of the Organization of the Petroleum Exporting Countries (OPEC) especially, Russia and Saudi Arabia are further compounding the problem (IMF, 2020). Conflict alone resulted in one of the



recent falls in the price of Brent crude oil witnessed in over 30 years by about 24% from US\$34/barrel to US\$25.7/barrel. Nigerian oil export is expected to decline in excess of US\$26 billion, which will subsequently affect the fiscal and external position of the country (IMF, 2020). The country's economy is estimated to contract by 3.4% in 2020, an indication of about six percentage points drop amid pre-COVID-19 projection, thereby creating a wide margin in the fiscal and external financing in the country (IMF, 2020).

Nigeria's economy is expected to plunge into a severe recession never seen in the last four decades in 2020 (World Bank, 2020a). In the best-case scenario using baseline, the country's economy is predicted to contract by 3.2% in 2020 under the assumption of average oil revenue price of US\$30 per barrel annually. In the same vein, the spread of COVID-19 will reduce drastically by the end of the second quarter of 2020 and subsequently continue in the 3rd quarter as well. This will result in a 5% point's reduction in the pre-COVID-19 growth projection prediction by 2.1%. By implication, the predicted recession will be costlier than the 2015-2016 recessions by almost twice and the deepest since the 1980s (World Bank, 2020a). In the same vein, NBS (2020) estimated the country's recession to be -4.4% averagely in 2020. However, it should be noted that the growth of the economy is highly uncertain and depend on the economy and the oil price recover which is currently caused by a conflict between Russia and Saudi Arabia and the impact of COVID-19 lockdown. Nigeria's failure to control the spread of the pandemic domestically will inflict a significant problem on the already drained healthcare system in the country, which will subsequently result in a spike in disease and death rate, specifically among the low-income households and vulnerable in the community (World Bank, 2020a; Singh & Chauhan, 2020).

The impact of COVID-19 in terms of the human cost in Nigeria will elevate much higher than loss of life, especially, as the economy contract, while the per capita income as well dropped. The pandemic is expected to push extra five (5) million people to leave under poverty as against the pre-COVID-19 projection. For instance, about 83 million people were living below the poverty line nationally, which translate into four (4) people out of every ten people in the country, with millions living just above the poverty line, leaving them vulnerable falling into the poverty trap, once a shock happens like COVID-19 pandemic. Over 75% of the country's poor are residing in the Northern part of the country. At the same time, a large chunk depends solely on agriculture for their daily bread as compared to the population living in the Central and Southern parts of the country where there is a high concentration of jobs (World Bank, 2020). According to Andam et al. (2020) Nigeria suffered a loss of US\$ 16 billion due to COVID-19 lockdown, with chunk amount coming from services sector.

Agriculture is the predominant activities and a source of employment among the populace in the country especially people residing in a rural location (Andam et al., 2020). The agricultural activities have been seriously affected by the impact of COVID-19 as a result of various measures to mitigate the spread of the pandemic. Globally agricultural resilient was tested by COVID-19, which saw a drop of about 20% in the prices of agricultural commodities. According to Andam et al. (2020)

Nigeria has suffered a loss in output production during lockdown estimated to be around 13.1%, which translate into US\$1.2 billion loss. Other sectors of the economy severely affected by the impacts of COVID-19 include manufacturing industry, education, financial, healthcare and pharmaceutical, hospitality, tourism and aviation, information technology, media, research and development, real estate and housing (Nicola et al., 2020). COVID-19 impact can also be traced socially; for instance, there was an increase in domestic violence during the lockdown period and increase in poverty rate among the households in Nigeria.

Pre-COVID-19 poverty rate projection was 0.1% points from 40.1% in 2019 to about 40.2% in 2020. However, due to the impact of COVID-19, the poverty rate is expected to increase to additional 2.4% points, which translate into 42.5% in 2020 suggesting that an additional 7.2 million will be pushed into poverty. COVID-19 impact alone is expected to increase the number of individuals push into poverty by additional 4.9 million people in the country in 2020, while a projected 6 million people will be pushed into poverty by 2022 because of COVID-19 (World Bank, 2020b). The pandemic has also affected the inflation in the country; for instance, food prices rose by about 14.7% in December 2020. However, by the end of March, the inflation rate in the country was 19.7% due to lockdown, which has the consequence of reducing the household's consumption (World Bank, 2020b).

The impacts of COVID-19 on households' consumption in Nigeria will be dire, together with an immediate health crisis, the tendency of reducing the household's income generation is exceptionally high. Leaving households unable to meet up with essential consumption requirement, thereby affecting household's food security status (Mukhtar, 2020a; Mukhtar, Mukhtar, Kamaruddin and Applanaidu, 2018a; Mukhtar et al., 2018b). Subsequently, this means that one in every two households are expected to reduce food consumption, to cope up with the COVID-19 pandemic. COVID-19 pandemic will bite harder on the household located in urban, than those in rural due to high dependency of income from services; this call for government programs and assistance to help the poor households in the country (World Bank 2020b).

The country has put forward various measures to help the poor households during the pandemic. For instance, the National Social Safety Net Program; however, the impacts of the program is considered minimal, especially when the population of the country is put into consideration. For example, less than 2% of the population benefited from social protection program known as (Beta don come), which literarily means "good things have come". At the same time, other associated social assistance programs are even lower. However, the only notable exception is the current school feeding program, which feeds an estimated 20.1% school children. Still, the closing of the schools to control the spread of the pandemic has also affected it in addition to their education and nutrition, which will have a negative impact on their human development in the future (World Bank, 2020a).

The world is presently facing enormous challenges due to COVID-19 and getting to know about the COVID-19 and its devastating impacts, especially on socio-economic activities of various households in the world. The pandemic has been

linked to the imminent recession never seen before in the last 20 years in Nigeria and specifically Kano, which has witnessed poverty in a proportionate scale, high rate of unemployment, specifically among the youth and high prices in staple food. Consequently, the pandemic trends of affecting every variable associated with socio-economic activities of households in the study area. The scale of the devastation when combined with COVID-19 pandemic is better imaged.

## **2. Literature Review**

COVID-19 pandemic is expected to have an overwhelmingly negative impact on socio-economics variables directly relating to households. According to Collivignarelli et al. (2020), the impacts of COVID-19 pandemic to households is dynamic and varies from one household to another. Messner (2020) on the other hand, noted that the pandemic's impact is more significant among the low-income households and has profound negative impact among the poor communities, especially where the population is highly dense, which can affect the social distance measure. Since the COVID-19 is now a pandemic affecting the world, scholars are investing time and resources to discover the impacts the pandemic has had in their society and a measure of reducing its impacts to the minimum level.

Martin, Markhvida, Hallegatte and Walsh (2020), investigated the socio-economic impacts of COVID-19 on household's consumption pattern and poverty. Using San Francisco Bay Area, and microeconomic model to evaluate the impact of social distancing on household socio-economic variables like income, savings, consumption and poverty. Finding reveals that the moment individual witnessed a drop in income, then savings are used as alternative to sustain consumption. At the same time, recovery necessitates household to save to replace the already depleted savings to the initial level of pre-COVID-19. Buheji et al. (2020) examine the degree to which COVID-19 pandemic has influenced socio-economic impact on world poverty, using integrative Literature Review (LR). The study identified how difficult and challenging it is to observe social isolation or lockdown measures put in place to control the spread of COVID-19 pandemic. The study, therefore, suggested an immediate plan to reduce the COVID-19 pandemic impact on the livelihood and socio-economic activities among the low-income families.

Ozili (2020) investigated COVID-19 in Africa: socio-economic impact, policy response and the opportunities associated with COVID-19 using discourse analysis. Findings reveal that the continent of Africa has been affected by the pandemic with the highest severity as compared with their counter parts in other regions of the world. Social distancing, depending on its strictness by the country's policies, affected the social interactions and economic activities in the continent. On the other hand, Bashir, Benjiang and Shahzad (2020) also examine the socio-economic and environmental impacts of COVID-19. Findings reveal that there is a positive impact of COVID-19 on environmental factors, which is significant and short-term in nature. At the same time, socio-economic and demographics are at the midpoint of the COVID-19 pandemic, which signified the reason why there is increase in infection, as well as mortality rate, which are closely related to a high-density populated location in society.

Awofeso and Irabor (2020) examine the assessment of Nigerian government response toward the COVID-19 pandemic impact on socio-economic conditions of the citizen, using secondary data. Findings from the study reveal a correlation between the pandemic and low socio-economic livelihood in the country. Government palliatives that were meant to reduce the negative impact of COVID-19 pandemic is grossly considered highly futile due to poor coordination, high human right infringements as well as insufficient fiscal policy.

### **3. Methodology**

The study area is Kano located in the northwest part of northern Nigeria, sited around the coordinates 90<sup>0</sup>30' and 10<sup>0</sup>30' north of Equator longitudes 70<sup>0</sup>34' and 90<sup>0</sup>25' East of Greenwich Meridian. Kano has over three million hectares of arable land approximately around 7,214 square miles, with an annual rainfall of 900 millimeters spanning for about four to five months yearly. Average temperature ranges from 30C-45C running from February through May every year. Kano is considered as the most populous State in Nigeria, with an estimated population of 9.4 million people according to the last Population Census of 2006 (National Population Commission [NPC], 2006). While considering an annual population growth rate of 2.6 percent, Kano estimated population is currently put at 13 million as of 2015 (NPC, 2016 & NBS, 2016). Note that Census 2006 was the last official census conducted in the country and therefore any figure arrived at afterward is purely on projection by the NPC in the country. The study selects Kano because of the large number of population and a subsequent higher number of poor households.

The study uses household as a unit of study, and one of the eligibilities is that respondents are the household heads. A multistage stratified non-probabilistic sampling method (Purposive) was employed involving four stages. The first stage involved stratifying Kano into Kano Urban and Kano Rural. Further stratification was carried out to demarcate Kano rural into Kano north and Kano south, while Kano urban was classified as Metropolitan. This is to allow for broader coverage among the households in Kano. At the third stage, a purposive selection of ten Local Government Areas (LGAs) from the total of forty-four (44) LGAs in the State, which comprises of two (2) LGAs from Kano Metropolitan, and four (4) LGAs each from Kano North and Kano South. At the last stage, a total of 426 regular households were selected out of 1,603,300 regular households' population in Kano according to the population census of 2006, since it is the last official census in the country (NPC, 2006). The LGAs selected for the survey and the number of households from each LGA include Kano Metropolitan (Kano Municipal – 50 respondents and Gwale – 50 respondents); Kano north (Dawakin-Tofa – 40 respondents, Gwarzo – 40 respondents, Karaye – 43 respondents and Kunchi – 42 respondents) while Kano south (Gaya – 40 respondents, Kura – 40 respondents, Sumaila – 40 respondents and Wudil – 41 respondents). From each of the LGA, four wards were selected, and a questionnaire was distributed using six (6) research assistants.

The study used primary data, which was sourced and collected through the household heads (farming and non-farming households) using a well-structured

questionnaire to capture the socio-economic impacts of COVID-19 in Kano during the lockdown with a strict compliance to all the procedures for COVID-19 preventions. Six hundred questionnaires were distributed among the household's heads in the survey area by the research assistants, 515 questionnaires were returned completed given 85% response rate. Data cleansing was carried out to detect and remove incomplete entries (84) were removed. After thorough scrutiny, a final response rate of 71% was achieved for the survey. Furthermore, the data were collected immediately the lockdown period was suspended in Kano in June 2020.

The survey further used descriptive analysis to analyze the data obtained for the study, specifically by using mean average, tables and figures, since the study intends to find the impact of COVID-19 on households' socio-economic variables.

#### **4. Result**

Table 1 reveals the socio-demographic profiling of households in Kano based on a regional basis. Table 1 reveals that 88% of the household head respondents were male in terms of gender status, while about 12% household respondents were female-headed households. Average age among the household respondents is estimated to be around 40 years. Majority or about 51% of the respondents are within their active productive age and ranges from 20-40 years of age. WHO (2020) noted that the impact of the COVID-19 pandemic is highly devastating among the elderly in the society, especially these with pre-medical conditions like hypertension, diabetic and other chronic illness. Between early March – April 2020 the study area has witnessed numerous death among the elderly in the society and these deaths were attributed to the COVID-19 and lack of medical attentions to these with pre-medical conditions in the study area, even though the assertion was later to be denied by the Kano State government (Kano, 2020). Table 1 indicates that, there are two (2) types of households the farming and the non-farming households. About 49% are farming households, while about 51% are non-farming households in the study area. In terms of marital status, 89% are married respondents, while 4% and 7% are divorced and widowed respectively. Average household size among the respondents is estimated to be ten (10) individuals per household, clearly showing that 63% of the households are within 1-10 individuals household size classification. About 56% of the household size is within the age of 18 years old, which translate into six individuals, while about 44% of the household size are adults. An average of 3 individuals within the age of 18 years attend school, which translate to about 48% of children under the age of 18 years old.

The study discovered that there is public awareness of the COVID-19 pandemic in the study area with 100% of the households fully aware of the virus. However, an appalling finding from the respondents suggested that about 65% didn't believe that COVID-19 is pukka. The study further discovered that the respondents have divergent views about the existence of COVID-19 pandemic. About 61% belief that government is playing politics with the pandemic and using it as a source of mobilizing funds both locally and internationally. This finding is in line with Odima (2020) which also noted that there exists distrust between government and the general public, and that government is only diverting the funds mobilized for

COVID-19. About 22% of those who don't believe in the pandemic, view the virus as disease only meant for the elites and wealthy people in the country and hardly affect common man in the society. This is also in line with finding from Campbell (2020) who also discovered a correlation between COVID-19 and the elites. About 10%, on the other hand, believe that, since Kano has one of the highest temperatures in Nigeria, the survival of the virus is near impossible, especially between February – April when the dry season was at its peak. While the remaining 7% respondents based their view purely on their personal belief and suggested that the virus is a common flu that everybody is used to in the society. Furthermore, about 45% of the respondent households indicated that at least two (2) or more of its household members has indicated the common signs of the pandemic like loss of taste or smell, dry cough, fever and sometime with sore throat. However, there is no scientific evidence to revealed that these symptoms are related to COVID-19.

Table 1: Socio-demographic Profiling of Households in Kano, Nigeria

Detail	Kano North (n=165)		Metropolitan (n=100)		Kano South (n=161)		Aggregate (n=426)	
	%	Average	%	Average	%	Average	%	Average
Gender Status								
Male	93		81		89		88	
Female	7		19		11		12	
Age								40
20-30	21		21		10		17	
31-40	26		39		36		34	
41-50	33		29		38		33	
51>	20		11		16		16	
Marital Status								
Married	92		86		89		89	
Divorced	3		9		1		4	
Widowed	5		5		10		7	
Household Size								10
1-10	59		90		39		63	
11-20	35		9		59		34	
21-Above	6		1		2		3	
Under 18 Years	56	6	53	4	58	7	56	6
Children in School	51	3	61	3	33	2	48	3
Adults	44	4	47	4	42	5	44	4
Household Types								
Farming	59		24		63		49	
Non-Farming	41		76		37		51	

Source: Field Survey (2020).

The first school of thought base their argument on government mistrust of public funds, which simply means diverting public funds for personal gains among government officials in the State. The second school of thought, on the other hand, noted that most of the people infected by the virus are wealthy and elite individuals in the society. This view is very appealing mostly due to the facts that national dailies always carry the news of government officials, celebrities, business moguls, academicians as well as media personalities who are exposed to the virus despite taking necessary precaution against the virus more than anybody. In the same vein Campbell (2020) also observed that majority of the COVID-19 affected individuals were wealthy elites in the societies.

According to World Health Organization (WHO) personal hygiene practices, especially washing hand under the running water with soap for at least 20 seconds or alcohol-based hand sanitizer; physical and social distancing of at least some meters away during any public gathering and the use of face mask are some of the effective ways to protect oneself from getting exposed to the COVID-19 pandemic (WHO, 2020). Sadly enough, the study discovered that an estimated 80% of the respondents displayed consistent neglect on these measures either due to lack of enough running water, high cost of face mask and hand sanitizer which cost about N100 (US\$0.3) and N400 (US\$1) respectively. The rate of the neglect is significantly higher among households in Kano north and Kano south, while in Kano Metropolitan the conformity rate of such precaution is significantly low, and it significantly varies between the household classifications.

Furthermore, Table 2 shows the socio-demographic profiling of farming households in the study area. Table 2 reveals that average farming experience among the households is 28 years with Kano south and Kano north having the highest average years of experience in the farming of 36 years and 35 years, respectively. At the same time, average cultivable land is estimated to be around 4 hectares. This shows that most of the farming in Kano is in small-scale and usually for a subsistent purpose. COVID-19 pandemic has forced many governments to introduce strict measures to control the spread of the pandemic, such as self-isolation and movement restriction (lockdown). Majority of the farmers in Kano have express fears that these measures may influence the outcome of the agricultural production this current season since the lockdown has deterred them from participating in the preparation for the farming season, which has since commence even before the lockdown. Therefore, about 75% of the farmer indicate a total disregard for the lockdown measures put in place by the government, especially farmers in Kano north and Kano south. However, in this regards, years of farming experience may likely play a vital role among the farmers, especially when the government eventually suspends the lockdown (Mukhtar, 2020b;2020c). In the same vein, most of the households were farming on a small-scale base; this will likely affect the food security status of the households in the study area (Mukhtar, 2020d).

Table 2: Socio-demographic Profiling of Farming Households in Kano, Nigeria

Detail	Kano (n=77)		North Metropolitan (n=45)		Kano South (n=103)		Aggregate (n=209)	
	%	Average	%	Average	%	Average	%	Average
Farming Experience		35		12		36		28
1-10 Years	14		68		10			
11-20 Years	43		23		51			
21-30 Years	28		7		27			
31-Above	15		2		12			
Cultivable Land	35	3	28	4	37	4	100	4

Source: Field Survey (2020)

Furthermore, Figure 4.1 shows the distribution of labour committed to farming activities in Kano, with about 33% of the total coming from the family labour. In comparison, the majority or about 67% constituted the hired labour which is also affected by the lockdown. Subsequently, the lockdown had also affected the number of workers that worked in the farm during the farming season, especially the hired labour.



Figure 1% Distribution of Labour Force for Farming Activities  
Source: Field Survey, (2020).

There are many indicators of socio-economic characteristics in a household, according to Darin-Mattsson, Fors and Kåreholt (2017) the significant indicators in socio-economic, which in turn influence other variables are occupation, education and income. Table 3 reveals the socio-economic characteristics of households in Kano. In terms of educational background and qualification, Table 3 reveals that 5% of the respondents had an informal education, 7% had primary school leaving certificate. In comparison, 18% had a secondary school certificate. These classifications of education represent the lowest form of education in the study area. Table 4.3 further reveals that 28% and 35% of the respondents had NCE/OND and first-degree certificate respectively, while only 7% had either second or third degree in the form of either MSc or PhD certificate. In terms of occupation, 9% of the household respondents reported loss of job from January – March as a result of COVID-19 pandemic. About 18% are engaged in private occupation. In comparison, the majority or about 42% are engaged in public sector occupation, and only 31% of the respondents engages in farming either as a part-time or full-time occupation. The implication here is the reduction of food security and other financial obligations which were affected by loss of jobs or reduction in monthly intake (Mukhtar, 2020d). Average income among the household respondents in the study area is estimated to be around N178,900 (US\$496) monthly, while average monthly expenditure in the study area is estimated to be around N131,400 (US\$364).

World Bank (2020) projected that prior to COVID-19 majority of the individuals in Nigeria survive under less than US\$2 (2019). This statement reflects a scarier figure in Kano, where a household's monthly average expenditure is estimated at N131,400 (US\$364), which translate into daily average of US\$1.20 if an average of 10 individuals in the study area is considered. The situation is even more frightening when we considered that the average expenditure is inclusive of food and non-food expenditure. This situation alone is enough to make both the



government and the individual households to have a rethink on the way and the manner they view COVID-19 pandemic. According to Andam et al. (2020) households suffered lost of income during lockdown which estimated at about 33%, while an estimated 27 million individuals were pushed into extreme poverty amid COVID-19 lockdown.

Table 3: Socio-economic Profiling of Households in Kano, Nigeria

Detail	Kano (n=165)		North Metropolitan (n=100)		Kano South (n=161)		Aggregate (n=426)	
	%	Average	%	Average	%	Average	%	Average
Education								
Informal	8		0		7		5	
Primary	11		0		10		7	
SSCE/GCE	12		6		37		18	
NCE/OND	34		20		29		28	
Bsc/HND	33		56		15		35	
MSc/Ph.D.	2		18		2		7	
Occupation								
Unemployed	10		13		3		9	
Private	16		29		9		18	
Public	39		46		42		42	
Farming	35		12		46		31	
Monthly Average Income								
Naira (#)		148,100		284,500		104,200		178,900
US\$		410		788		289		496
Monthly Average Expenditure								
Naira (#)		116,600		211,500		66,000		131,400
US\$		323		586		183		364

Note: US Dollar (\$) exchange for an average of CBN rate of #361 March-July (CBN, 2020)

Source: Field Survey (2020)

Figure 2 shows the structure of a household's expenditure in the study area, with 61% of the expenditure spent on food items, while about 39% on non-food expenditure. The implication is that a large chunk of household's income is spent on food expenditure during the lockdown period. Subsequently, this will affect investment and savings in the study area. About 75% of the respondents attributed panic buying and the high cost of foodstuff in the first week before the lockdown as the cause of the increase in food expenditure by households, especially as fear and nervousness forced the household to make a hasten decision on such purchases. This finding is in line with the finding of Kuruppu and De Zoysa (2020). Also, Baker et al. (2020) noted a 50% increase in USA households spending on food items. However, 25% attributed the increase to inflationary pressure, which the country witnessed for the last eight straight months in April, which also closely relate to the challenges of COVID-19. According to NBS (2020), the country's inflation in July was 12.82%, which represents the highest in more than two (2) years. Subsequently, this resulted in increased food index to rise in the price of

yams and tubers, bread and cereals, potatoes, oil, fish and meat, fruit and vegetables.

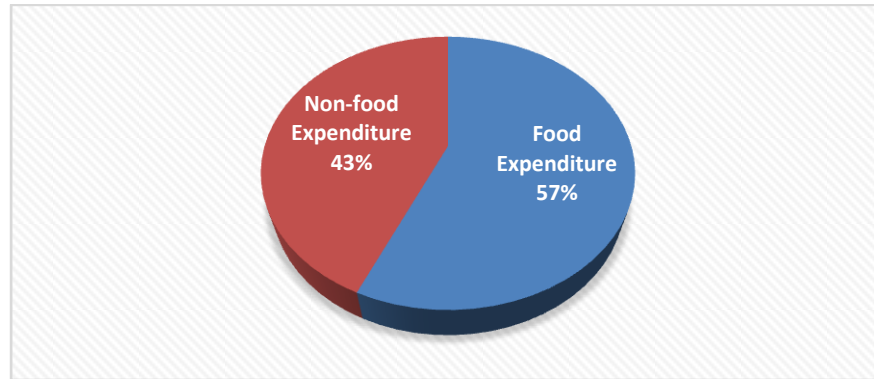


Figure 2: Structure of Household's Expenditure

Source: Field Survey, (2020).

The impact of COVID-19 on socio-economic variables is calamitous, and the impact is even more captivating when other calamities combine with COVID-19 like conflicts or disaster (Mukhtar, 2020e; 2020f). As a measure to control the spread of the pandemic, the State government imposed a lockdown measure in the State. However, the measure comes with grave consequences, especially to the socio-economic activities of households. For instance, in terms of occupation, 10% of the household heads lost source of income due to COVID-19 pandemic; majority of, which are engaged in private sector. In the same vein, economic activities were bought to a standstill as all workers were asked to stay back home and observed the total lockdown measure, while all schools in the study area were as well closed down. Majority of the households expressed concerned of psychological trauma and expected loss of jobs if the condition persisted, especially these in the private-sector.

In terms of education, the lockdown has forced all educational centers to close down since March 2020, which resulted in boredom at home, depression and lack of total freedom to students. As shown in Table 1 each household, has an average of three (3) children attending school ranging from primary to secondary, closing down the school affected their education and subsequently, will affect the school feeding, which in turn affect the nutritional condition of the children in the study area. This estimate is in line with NBS (2020) findings, which also estimated that each child would cost about N70 (US\$0.2) per meal of a day and N1,400 (US\$4) per month. However, this programme is substituted with Home Grown Feed during the lockdown in three States of the nation without Kano. While the study also discovered that only 2% of the respondents were able to employ the service of the private lesson teachers to teach their wards during the lockdown.

About 83% of the respondent's household heads indicated that during the lockdown, they had witnessed a drop-down in their income level due to COVID-19 especially these involved in the private and public sector under the State level of

between 20-30% monthly. In contrast, those in private sectors, especially those in private schools and private business, reveals that to cope with the COVID-19 pandemic their savings and business capital were used for survival during the pandemic. Only households that are employed in the public sector at the Federal level indicate no loss of income. At the same time, those involved in lecturing at the federal university level indicated that monthly income has since been stopped due to the on-going nationwide strike between the university's union and the Federal Government. The study further observed that, there was high disregard to the government instruction on lockdown especially among the private sector employees. About 35% of the respondents indicated their refusal due to the fact that, if they stay at home, they can not afford to feed their family.

For every situation, there is bound to be opportunities that comes along with it, COVID-19 is not exceptional. The pandemic has taught households to maintain a hygienic environment and hygienic lifestyle, specifically 45% of the respondents indicated that they wash their hand regularly in order to avoid or prevent themselves and their family from the COVID-19 pandemic. Another positive impact of COVID-19 noted is in the area of business opportunities, about 25% of the respondents involve in private commercial businesses especially in textiles, provisional stores and some eateries go online to advertise their products and services, while at the same time making home delivery to their customers. Even though such type of businesses highly depends on the availability of strong network service and the electricity supply in the study area which is a big challenge presently. The respondents further stated that their effort is influenced by the presence of numerous police and military checkpoints, which extract money inform of bribery before given the permit to operate peacefully and that makes them increase the prices of the goods delivered to customers during the lockdown. About 62% of the respondents also see COVID-19 pandemic as the cause of bonding among the families, even though this is a positive impact; however, it comes with a lot of negative impacts. For instance, about 15% of the respondents believed that it has also increased domestic violence among the spouses, while children molestation and abuse saw a raise among households during the lockdown. About 20% of the respondent think this lockdown can easily lead to unwanted or unplanned pregnancy, especially with a high level of poverty and a high number of children dependency ratio in the study area, this can easily backfire and push more households into poverty trap in the next one or two years.

Generally, COVID-19 has already exposed the weakness of health service of the country. For instance, according to the United Nations Children Fund (UNICEF) there is likelihood that COVID-19 will kill more than 170,000 children in Nigeria in the next six (6) months, in addition to another 6,800 maternal casualties. Accordingly, this will affect all the achievement made in the last two decades of decreasing preventable child and maternal deaths in the country (UNICEF, 2020). As a result of COVID-19 medical supply chains have been disrupted, lockdown, curfews and disruption in transportation system has forced a decline in hospitals visitation. Consequently, COVID-19 serves as a severe threat to the already existing fragile healthcare system of Nigeria (UNICEF, 2020).

Government efforts to control the pandemic have serious negative consequences to the socio-economic livelihood of the poor and vulnerable in the society, while the effort to sustain the economy has proven defective by all standards. Firstly, there is a poor coordination of the palliative aids to the less privilege in the society, the criteria used for the selection of the less privilege has fallen short of the standard outline by the World Bank (2014). Thus, the tendency of the palliative to reach its target is seriously put into doubt. Majority of the beneficiaries of the palliative are card carrying members of the ruling party and loyalists, while the less privilege individuals whose means of livelihood was negatively influence by the impact of COVID-19 were neglected by the system that is by mere lack of accountability (Njoku et al., 2020). Other States governments deliberately warehouse the palliative without distributing it to the less privilege households, thereby making people accuse the government of intentional diversion of the palliative for personal gains.

### **5. Conclusions and Recommendation**

Kano seem to have flatten it COVID-19 curve going by the recent case recorded by the State, with an average of one (1) of COVID-19 case for the month of September 2020, it has seen the State recording less than 10 cases in the whole month (NCDC, 2020a). However, the State government efforts in terms of fighting the pandemic have left much to be desired in the first wave. The State government should therefore make adequate provisions for the second wave of the pandemic, more especially as there is no universally approved vaccine or medication for the virus presently. Firstly, the State government need to gain back the confidence of the public, so that their can get some level of trust, in such a way that common man can believe and trust any information coming from the State government. The State should therefore fight corruption head on and lead by example in such a way, any culprit should be dealt with irrespective of his position in the society. Government should also make a total overhaul of the entire healthcare systems in the State, especially in the Local Government Areas of the State.

Government policies to cushion the negative impact of socio-economic losses suffered by the households need to be improved significantly, especially the loss in incomes as a result of total lockdown. Therefore, adequate economic policy that is considered sizeable as well as targeted to the poor and less privilege devoid of political appellation should be put in place. In the same veins government should support private firms including private schools that suffered from the consequence of total restrictions on their activities. Specifically, teachers in private schools were left without monthly salaries or a drastic reduction in their salaries during the lockdown period.

Fighting COVID-19 pandemic is all about sacrifice in it totality and there is the need for the public to embrace the new normal of “COVID Safety First”. Therefore, both government and the citizen in the State must sacrifice and follow the preventive measures religiously. Chinese government was able to fight the pandemic majorly because of dedications and sacrifices made both during and after the pandemic. Face mask should be mandated at all level, while government should engage in mass production and distribution at a subsidize rate that the poor can

afford. Government need to be strict with issue of opening its international airport. All measures for the prevention of COVID-19 should be put in place in the two (2) airports to be used for anybody coming into the country, while 14 days isolation centers should be maintain in the airport, with adequate healthcare facilities, especially oxygen concentrator. While it is strongly recommended that the government should operate internationally within the two airports since domestic airline are fully in operation, so as to effectively monitor the inflows of both the citizen and foreigners coming into the country. In terms of schools opening government has found itself in a bit of a pickle between preservation of life, which is of paramount important and the pursuit of educational certificate.

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**An Empirical Study on Impact of Labour Productivity, Dependency Ratio on Working Poverty in Sub Saharan African Countries (SSA): An Auto Regressive Distributed Lag (ARDL) Model Approach**

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**Abstract**

*Following the global shock in late 2019 resulting from the Novel Covid-19, the overwhelming effect on the global economy cannot be over-emphasized. Hence SSA economies must strategize to reduce the surge impact on poverty. This study seeks to empirically investigate the impact of labour productivity, dependency ratio poverty on aged 0-25 and working poverty aged 25 years and above. This study employed the heterogeneous panel data comprising of (38) sampled countries for the period 2008 to 2020. Applying the Autoregressive Distributed Lag Model, the result of the study revealed that coefficient poverty aged 0 to 25 had a positive and statistical significant impact on working poverty aged 25 years above at one percent level of significance indicating that there is a long run relationship. This also shows that a long run causality relationship exists. Labour productivity depicts a positive effect on working poverty although not statistically significant indicating no long run causality effect. The parameter dependency ratio revealed a negative and statistical significant impact on working poverty in the long run at one percent level of significance indicating a long run causality effect. The ECM indicates a joint influence of all explanatory variables on the dependent variable on working poverty. It explains the long run convergence to equilibrium at the speed of 16%. On short run relationship, that there exist a positive and short run causality effect between working poverty aged 0 to 25 and working poverty aged 25 years and above. However, there is no any other short run causality relationship among remaining series.*

**Keywords:** Working Poverty, Dependency Ratio, Labour Productivity, GDP per capital

**JEL Classification:** J24, P36

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**1. Introduction**

The volatile nature of GDP per capital in SSA in 2020 had implication on poverty outcomes as a result of poor labour productivity (Montes, Silwal, Newhouse, Chen, Swindle and Tian 2020) No doubt, the estimated GDP per capital growth

(labour productivity) will be affected by the global pandemic. Thus, given the forecasted SSA's GDP per capita estimated to grow at 1.7%, Presently, with shock of the pandemic, it is more than 5-7 percentage points lower, contracting 3.1% in the baseline scenario and in 5.5% in the low scenario (Montes *et al* 2020). The implication on working poverty is enormous that the extreme poverty will rise to about 26 million and as much as 58 million persons in SSA would live below US\$1.90 as defined by 2011 PPP (Montes *et al.*, 2020). The global share of Sub Saharan Africa labour productivity had increased but it is far less compared to South and East Asian countries. For instance, between 1991 to 2000 Labour productivity in SSA stood at -0.7%. It further rose in 2000 to 2009 to about 1.9% on the other hand, in South Asia, the value stood at 3.4% in 1991 to 2000 and 4.5% in 2000 to 2009. In East Asia, it stood at 7.6% and 7.8% in 1991 to 2000 and 2000 to 2009 respectively (ILO, 2011). Within the period of 2008 to 2013, Productivity growth was 1.8 and it fell sharply to 0.5 in 2015 and 1.7 in 2017, while the effect on working poverty recorded between 2000 to 2017, shows the number of persons living between 1.90 to 3.10 dollars stood at 23.8; by 2016, it rose to 30.0 and 30.04 in 2017 (ILO, 2015; ILO 2018). This trend shows that about 137.3 million persons suffer extreme working poverty in 2017, it rose to 138.3 in 2018 and 138.7 in 2019 (ILO 2018). This study is apt and timely due to global sustainable goal realization especially on productivity and working poverty.

More so, ILO (2003) in its World employment report states that, very scanty literature is available on productivity and poverty less consensus. However, rising labour productivity had impact on reducing working poverty. Despite the declaration made for a decade by the general assembly at the Second United Nations for the Eradication of Poverty (2008-2017), in order to actualize the realization of the internationally agreed development in December 2007 to mitigate poverty with SSA inclusive, Sub Sahara African working poverty continued to increase significantly. Hence, south Asia continued to record significant success in reducing working poverty in the region thus reaching the desired target of millennium development goal in 2015. Although there are studies on labour productivity on SSA, these studies are basically on economic growth (see Zulu and Banda 2015). Studies on poverty were scanty (see Adelowokan; Maku; Babasanya and Adesoye 2019; Dursun and Ogunleye 2014) mostly single country analysis. It is in view of the forgoing background that this study investigates empirically the impact of labour productivity on working poverty in SSA countries. Hence this study is structured into five sections, this section being the introductory section, Section two discusses the theoretical framework, section three looks at data and methodology, section four deals with data analysis and interpretation and section five which is the final section looks at conclusion and made some recommendations.

## **2. Literature Review**

There are dearth of empirical literature on the relationship between labour productivity and working poverty with mixed evidences and methodologies. Dursun and Ogunleye (2014) used the panel unit root test, Kao test, Pedroni test and panel causality to estimate the nexus between economic growth, employment and

poverty using sample of seven (7) West African countries for the period 1991 to 2010, result of the study reveals that per capital income has a positive and statistical significant impact on poverty reduction. However, employment has no any effect on poverty. In addition, a long run and short run causality relationship exist between GDP growth, employment and poverty.

In another study, Adelowokan; Maku; Babasanya and Adesoye (2019) used data on Nigeria to estimate the relationship between unemployment, poverty and growth for the period 1985-2015 applying ADF Cointegration test, Error Correction Model granger and causality test approach. The result of the study indicates that there is no causality and no long run between unemployment poverty and growth. However, there is a positive relationship between poverty unemployment interacted with growth.

Similarly, Richard, Adams and Page (2003) in their study use data on Selected Middle East and North Africa Countries to estimate the relationship between Poverty, Inequality and Growth in Selected Middle East and North Africa Countries for the period 1980 to 2000, applying ordinary least square regression technique, result of the study revealed that government employment has a positive and statistical significant impact on poverty reduction on MENA countries.

However, in a study, by Torm (2003) sampled Armenia, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan and Uzbekistan to estimate the significance of GDP growth and employment determining poverty in countries under study and the result of the study revealed that poverty reduction is enhanced through economic growth and must be employment-intensive, which will result to higher labour productivity and rising incomes and at the same time reduce the level of poverty. Firman, Bariyah and Kurniasih (2020) used data on West Kalimantan Province to investigate the effect of labour productivity on working poverty for the period 2008 applying correlation analysis, the result of the study shows that labour productivity has a negative impact on working poverty.

#### *Theoretical Framework*

Labour productivity is an important condition for improving working poverty and promoting sustainable wage growth. The Neoclassical growth theory emphasized basically on supply side factors such as labour productivity, size of the work force and factor input. They argued that productivity is a function of inputs and these includes labour and capital (Solow, 1957) and also technology which increases labour productivity. Thus when labour productivity (output per capital) increases, poverty tend to diminish.

Hayes *et al.* (1994) associated level of education to poverty reduction. The authors argued that low educational attainment leads the poor to work in low skill jobs for low wages, and therefore makes them more susceptible to remaining poor. The authors believe poverty and productivity relate to each other in a circle, affecting one another.

The new theories of endogenous technical progress assumes important place in explaining labour productivity and working poverty. The theory argued that productivity growth is driven by the rate of technological innovations, which

translate to new products, new processes, and new approach to organizing production. Entrepreneur skills, research and development and decent working environment also ultimately determine productivity growth.

Krugman (1990) argued that productivity, income distribution and unemployment are determinants of economy, thus full employment, foster productivity growths are measures of measuring poverty. The theory underpinning this study is the theory by Solow 1957

**3. Methodology**

The study seek to investigate empirically the relationship between determinants of working poverty in Sub Saharan African countries applying sample of (38) countries for the period 2008 to 2022. The sample countries includes: Angola, Benin, Botswana, Burkina Faso, Burundi, Cape Verde, central African Republic, Congo, Congo Dem Republic, Cote d’Ivoire, equatorial guinea, Ethiopia, Gabon, Gambia, Ghana, guinea, guinea Bissau, Kenya, Liberia, Madagascar, Malawi, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, Somalia, south Africa, Sudan, Tanzania, Togo, Uganda, Zambia and Zimbabwe The rationale of employing the span period of study is the use of non-probability sampling technique in form of availability of data. Data is sourced from International Labor Organization (ILO).

*Technique of Analysis*

Applying the heterogeneous panel, this study seeks to employ the Panel stationarity test, panel autoregressive distributed lag model and panel causality test approach. Thus the behavior of the data will determine the conditions for further analysis. The families of pooled mean groups will be selected using the probability p-value. For instance, choosing between MG and PMG, If P-value>0.05 then run PMG otherwise the MG should be estimated. In any case, selecting between DFE and MG If P-value>0.05 use DFE otherwise use MG

The generalized ARDL ( $p, q_1, q_2, \dots, q$ ) model is expressed as:

$$y_{it} = \sum_{j=1}^p \delta_j y_{i,t-j} + \sum_{j=0}^q \beta'_{ij} x_{i,t-j} + \Phi + e_{it} \dots \dots \dots 1$$

In this case,  $y_{it}$  mean dependent variable ( $\beta'_{it}$ )' is a  $k \times I$  vector that are allowed to be purely I(0) or I(1) or cointegrated  $\delta_{ij}$  is the coefficient of lagged dependent variable called scalars;  $\beta_{ij}$  are  $k \times I$  coefficient of vectors;  $\Phi$  is the unit specific fixed effects;  $i = 1, 2, \dots, N; t = 1, 2, \dots, T; p, q$  are optional lagged orders;  $e_{it}$  is the error term or white noise.

There parameter ARDL  $p, q_1, q_2, \dots, q_T$  error correction model is specified as:

$$\Delta y_{ij} = \theta_i (y_{i,t-1} - \lambda'_i X_{i,t}) + \sum_{j=1}^{p-1} \xi_{ij} \Delta y_{i,t-j} + \sum_{j=0}^{q-1} \beta'_{ij} \Delta X_{i,t-j} + \varphi_i + e_{it} \dots \dots \dots 2$$

Note:

$\theta_i = -(1 - \delta_i)$ , group specific speed of adjustment coefficient (expected) that ( $\theta_i < 0$ );  $\lambda'_i = \text{vector of long-run relationship}$ ;  $ECT = [Y_{i,t-1} - \lambda'_{i,t}]$ , the error correction term.; and  $\xi_{ij}, \beta'_{ij}$  are the short-run dynamic coefficients.

*Variable Measurement and Definition*

Poverty: This is measured as Proportion of population that fall below the international poverty line (%). This is in line with the measure by international labour organization (ILO, 2020). Dependency Ratio: this is measured as the number of population whose dependents were classified from age zero to 14 and age 25 and above. Labour productivity: This parameter is measured as the Annual growth rate of real GDP per employed person estimated in (GDP constant 2010 US \$) (%). This is in line with measure by (See ILO 2020)

**4. Results**

Macroeconomic time series are known to be non-stationary, and in real analysis, diagnostic test for series is required to have a robust estimation. From the result, all series were not stationary at level values and while a few are stationary at first difference 1(1) others series are stationary at second difference 1(2) (Pesaran and Smith, 1995 and Pesaran, Shin and Smith 1997). after employing the ADF and PP panel unit root test and employing the xtpmg pg, pmg and Hausman Sigmamore, result shows that the pmg model is most appropriate given the rule of thumb If P-value>0.05 then run PMG otherwise MG should be estimated. In this case the pmg is chosen over the mg because Prob>chi2 = 0.1763 is greater than 0.05%(see Blackburne and Frank, 2007; Pesaran, Shin and Smith 1997).

Table 1: ARDL long run estimate

Variables	Mg	pmg	dfe
to25	-2.5828** (3.15)	0.6771*** (0.004)	0.9746*** (0.02)
Labprod	-3.1295** (3.37)	0.00082* (0.001)	-0.0785*** (0.027)
Depratio	54.1234* (98.39)	-0.4824*** (0.06)	-1.4218** (0.98)

Notes:\*\*\* \*\* \*denotes statistical significance at 1%, 5% and 10% respectively p-values (in parentheses).

Source: Author Computation

This study found that the probability value of Hausman test shows that the PMG is appropriate compared to MG given the P-value>0.05. Consequently, this study used the PMG full estimation to show the heterogeneity of countries, short and long run effects and ECM which varies across panels. As shown in Table 1, the coefficient poverty aged 0 to 25 had a positive and statistical significant impact on working poverty aged 25 plus at one percent level of significance indicating that there is a long run relationship. By causality implication, it also explains a long run causal effect relationship.

Labour productivity depict a positive effect on working poverty although not statistically significant, indicating no long run causality effect. This confirms the study by Adelowokan; Maku;

The parameter dependency ratio revealed a negative and statistical significant impact on working poverty in the long run at one percent level of significance. This

also posit that, there is a long run causality effect between dependency ratio and working poverty in SSA countries for the period covered. This finding confirms the findings of Torm (2003). The ECM  $-.1659956$  and It explains the long run convergence to equilibrium at the speed of 16%.

Table 2: Short run causality for pmg estimation

Variables	coefficients
Constant	0.2933*** (0.11)
to25	0.8223*** (0.06)
Labprod	-0.0039** (0.003)
Depratio	-0.1466* (0.94)
ECM	$-.1659956$ *** .046847

Notes: \*\*\* \*\* \*denotes statistical significance at 1%, 5% and 10% respectively p-values (in parentheses).

Source: Author Computation

The Pmg assumes that the long run coefficients are the same for all the units that makes up the sample countries in the panel. The result in table 2 shows that there exists a positive and short run causality effect between working poverty aged 0 to 25 and working poverty aged 25 years and above. However, there is no any other short run causality relationship among remaining series. It is important to note that another assumption of pooled mean group is that the short run coefficients and error variances are not the same for countries that make up the panel. For example, Angola shows a short run causal effect which also exists between working poverty aged 0 to 25 and working poverty aged 25 and above. The result for Benin indicates a positive short run causality between working poverty aged 0 to 25 and working poverty aged 25 and above and any deviation in the equilibrium would be corrected at 53% speed of adjustment.

Similarly, the result for Botswana shows dependency ratio with a significant sign indicating a short run relationship and a short run causal effect. The result for Burkina Faso indicates working poverty age 0 to 25 has a positive short run effect on working poverty while dependency ratio posit a negative short run causality effect on working poverty.

#### *pov25plus to25 labprod depratio*

In Burundi, there exist a positive short run causality effect between working poverty aged 0 to 25, dependency ratio and working poverty aged 25 years above. The coefficient labour productivity posit a negative short run causality effect on working poverty aged 25 year and above.

In Cape Verde, labour productivity and poverty within aged 0 to 25 have a short run causal effect on working poverty in SSA. Deviation in equilibrium can be

restored by 39% speed of adjustment. For Central African Republic, only working poverty aged 0 to 25 had a positive and short run causal effect on working poverty aged 25 years above.

However, the result for Congo revealed that only working poverty aged 0 to 25 had a positive short run causal effect on working poverty aged 25 years plus and disequilibrium can be corrected at 83% speed of adjustment. For Congo Dem republic, of all coefficients, only labour productivity and working poverty aged 0-25 years revealed positive short run causality effect on working poverty aged 25 years plus. Cote d'ivoire for instance, just working poverty aged 0 to 25 had a short run causal effect on working poverty aged 25 years plus or above. In Equatorial Guinea, only dependency ratio posit a negative and short run causality effect on working poverty aged 25 years plus and any deviation from that can be adjusted at speed of 92%.

The result for Ethiopia posit that only working poverty aged 0-25 had a short run causal effect on working poverty aged 25 years and above. Surprisingly, the result for Gabon shows no any causality effect of coefficients on working poverty at all. Gambian result revealed that labour productivity and working poverty aged 0-25 had a positive and short run causal effect on working poverty aged 25 plus and any deviation in equilibrium can be adjusted by 22% speed of adjustment. For Ghana, just working poverty aged 0-25 had a positive and short run causal effect on working poverty aged 25 years and above and incase of deviation, a speed of adjustment at 28% can correct that equilibrium. The result for Guinea shows that just working poverty aged 0-25 indicates a positive and short run causal effect on working poverty aged 25 years and above. For Guinea Bissau, the result revealed that labour productivity, dependency ratio exerts a negative sign and working poverty aged 0-25 had a positive sign thus, have short run causal effect on working poverty aged 25 years and above. For Kenya economy, the result revealed that both dependency ratio and working poverty aged 0-25 have a positive and short run causal effect on working poverty aged 25 years and above and deviation can be corrected at 13% adjustment speed.

Similarly, the result for Liberia indicates that dependency ratio and labour productivity impact negatively and had short run causal effect while working poverty aged 0-25 had a positive sign and short run causal effect on working poverty aged 25 years and above. In Madagascar, the result shows that dependency ratio impact negatively on working poverty aged 25 years plus while working poverty aged 0-25 indicates positive and short run causal effect. The result for Malawi indicates that only working poverty aged 0-25 had a short run causal effect on working poverty aged 25 plus. Mauritania for instance, shows a negative short run causality effect between dependency ratio and working poverty aged 25 years and above. For Mauritius, there is no any short run causality at all. However, in Mozambique, the result depict a positive short run causal effect between working poverty aged 0-25 and working poverty aged 25 plus. Namibia result shows that dependency ratio and working poverty aged 0-25 have positive and short run causality effect more than working poverty aged 25 years plus. Thus, any deviation can be corrected at 11% speed of adjustment. The result on Niger economy shows

that dependency ratio, labour productivity have negative and short run causality effect on working poverty aged 25 years plus while working poverty aged 0-25 had a positive and short run causal effect on working poverty.

The result for Nigeria indicates that labour productivity had a negative short run causal impact on working poverty while working poverty aged 0-25 had a positive and short run causal effect on working poverty 25 years plus. For Rwanda economy, labour productivity had a negative causal effect and working poverty aged 0-25 has a positive short run causal effect on working poverty aged 25 years plus. More so, the findings of Senegal also shows a negative causal effect between labour and working poverty aged 25 plus while aged 0-25 had a positive short run causality effect on working poverty aged 25 years and above. This finding is closely similar to that of Nigeria.

Sierra Leone result shows that of all coefficients, only working poverty aged 0-25 years have short run causality effect on working poverty aged 25 years above. For Somalia, it is also the same as only working poverty aged 0-25 has a positive short run causal impact on working poverty aged 25 plus. In South Africa, only working poverty aged 0-25 impact a short run causal effect on working poverty aged 25 years plus. For Sudan economy, there is no any short run causality effect of coefficients on working poverty. The result for Tanzanian economy revealed that only working population aged 0-25 had a short run causal effect on working poverty aged 25 plus. The findings on Togo indicates that only working poverty aged 0-25 had a short run causal effect on working poverty aged 25 plus. In the same vein, the findings on Uganda also indicates that only working poverty aged 0-25 had a short run causal effect on working poverty aged 25 plus. In the same vein, the findings on Zambia also indicates that only working poverty aged 0-25 had a short run causal effect on working poverty aged 25 plus. In the same vein, the findings on Zimbabwe also indicates that only working poverty aged 0-25 had a short run causal effect on working poverty aged 25 plus.

##### **5. Conclusion and Recommendation**

The recent pandemic had continued to increase working poverty and reduced labour productivity across the globe. It is in the light of this that this study seeks to investigate the impact of labour productivity, dependency ratio and poverty aged 0-25 on the working poverty in SSA for the period 2008 to 2022. Applying the Autoregressive Distributed Lag Model, the result of the study revealed that coefficient poverty aged 0 to 25 had a positive and statistical significant impact on working poverty aged 25 years above at one percent level of significance, indicating that, there is a long run relationship. This also shows that a long run causality relationship exists. Labour productivity depicts a positive effect on working poverty although not statistically significant as such indicating no long run causality effect. The parameter dependency ratio revealed a negative and statistical significant impact on working poverty in the long run at one percent level of significance indicates a long run causality effect. There exists also a long run convergence to equilibrium at the speed of 16%. Contrary to a short run relationship, there exists a positive and short run causality effect between working



poverty aged 0 to 25 and working poverty aged 25 years and above. However, there is no any other short run causality relationship among remaining series.

*Implication for Policy*

Although labour productivity posits a positive but non-significant impact on working poverty; implication is that there is need to strengthen reform structurally toward productivity, this would imply providing a framework that allows for decent working environment and training of man power to enhance productivity in SSA countries.

However, dependency ratio posit a negative and significant relationship on working poverty hence a more proactive measure to provide social support program for the aged person cannot be over emphasized. Thus, a policy framework to achieve the articulated design plan of ILO is important in reducing the outcome of working poverty in Sub Saharan African countries.

The size of ageing population has implication on working poverty. Thus there is need to evolve a strategy, to invest adequately through social protection policy for instance, accessing health protection and long term care as well as training the ageing population perhaps there would be less dependency on working poverty. Hence both labour market institution, private sector and government must consolidate on previous achievement, going forward enforce adequate data bank and the study of ageing population across the globe.

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## **External Debt Stock, Real Exchange Rate and Economic Growth in Sub Saharan Africa: A System GMM Approach.**

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### **Abstract**

*This study investigate the impact of external debt on economic growth in Sub Saharan African (SSA) countries, the study sampled 13 SSA countries using the System GMM estimation for the period 1999 to 2019, the study period is justified owing to economic rigidities and shocks that has continued to bedevil the SSA region. The result of the study revealed that the lagged value of economic growth has a positive and statistical significant effect on current growth. A positive but non-significant relationship exists between external debt and economic growth in the short run. Gross fixed capital formation had a positive but non-significant relationship with economic growth. The coefficient exchange rate revealed a negative and statistical significant relationship on economic growth.*

**Keywords:** External, Debt, Gross Fixed Capital formation, Real Exchange Rate

**JEL Classification:** F31, H63

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### **1. Introduction**

Debt Sustainability Framework (DFM) is a policy designed by World Bank and IMF to review periodically project debt sustainability as a function of past debt, interest payment and financing lacuna projected in the Gross Domestic Product (GDP), exchange rate, government revenue and expenditure in low-income countries (Battaile, Hernández & Norambuena, 2015). Despite the policy option, it is glaring that Sub Saharan African countries are guilty of violating it. Shockingly, the period 1981 and 1990 occasioned by SAP 1986, when the average annual growth rate of real GDP in Sub Saharan Africa pegged at 1.7%. Albeit rising rate in population growth rate and poverty, the average annual growth rate of GDP per capita for the period between 1981 and 1990 stood at -0.9 (Iyoha, 1999).

In 1990, external debt build-up to about US\$176.36 billion, it further rose to about US\$235.94 billion in 1995, the region is saddled with rapid debt profile peaking to US\$269.08 in 2010. To worsen the situation, SSA region was reported to have recorded US\$367.51 billion in 2013. Of particular concern is the report where estimates show that about half of the countries in the sub Saharan region have recorded double external debt stocks (International Debt Statistics, 2020).

In 2018 for instance, the average debt-to-GNI and debt-to-export ratios of countries in SSA region with the exception of South Africa, stood at 32% and 127%, respectively; the comparable ratios for 2009 were 24% and 87% (International Debt Statistics, 2020). Borrowing externally may not be inimical to growth for it is used to finance basic real economic indicators that can spur growth. Despite the activities of World Bank and IMF on debt sustainability analysis, risk of caveat on debt distress as well as framework and path way to mitigating debt crisis across SSA countries, the effort yielded less response.

There are several studies on nexus between external debt and GDP but largely on single country analysis. Relatively few studies have emerged on panel data analysis, of particular concern is Generalized Method of Moments (GMM) (Senadza; Fiagbe & Quartey, 2018; Daud & Podivinsky, 2012). More so, the period under study 2009 through 2019 unravels structural economic rigidities and economic crisis especially recession of 2009 which technically, may increase the SSA countries' debt profile. In addition to the above mentioned, the dynamics of debt has an unclear movement, thus results to researches with mixed evidences.

From the forgoing background, this study seeks to investigate the nexus between external debt, real exchange rate and economic growth and other factors that affect economic growth. This study is structured into five sections including the introduction. Section two of the study explores the literature review, section three discusses the methodology, and section four explains the data analysis and presentation while section five of the study includes the summary, conclusion and implication for policy direction and implementation.

## **2. Literature Review**

### *Theoretical Framework*

Several theories have shown that debt can endanger growth prospect, for instance the classical economist Ricardo (1951) perceived debt to be inimical to growth future prospect. Scarcely resource economies resort to borrowing to implement administrative goals and target projects. The dual-gap theory postulated by Chenery and Strout (1966) support the savings gap and foreign exchange gap, and rationalized motive on the introduction of external borrowing to a growth model. The savings gap and foreign exchange gap explains that domestic economies with less resource base to undertake and accomplish a desired or expected level of growth and development will require borrowing thus, external borrowing cannot be underscored hence, a function of saving-investment gap, import-export.

Debt is inevitable, although debt accrued to cover saving-investment gap maybe a deleterious to some economies. The debt overhang hypothesis can be traced to the works of Krugman, (1988) explains that when debt accumulates to a defined threshold, it can inhibit the credibility of the debtor to repay its debts. The debt overhang hypothesis explains the implication of too much borrowing as it affects the credibility of the debtor to pay the principal with interest. When countries borrow resources beyond certain threshold, they are subjected to pay the principal and the interest that accrues to the money borrowed over time. Sachs (1986) argued

that countries with expanded debt ratio might raise the future tax rate thus inhibit growth prospect.

There are several studies on the nexus between external debt and economic growth with mixed evidences. In a recent study, Edo, Osadolor and Dading (2020) used the auto regressive distributed lag (ARDL) to investigate nexus between external debt and economic growth in the countries for the period 2005 to 2017. The result of the study reveals that there is insignificant positive impact of both external debt and export on economic growth in the short run. Senadza; Fiagbe and Quartey (2018) in their study employed the GMM technique to estimate the impact of external debt on GDP using panel data of 39 SSA countries for the period 1990 to 2013. Their study revealed that, external debt negatively impact on growth in SSA. Statistically, a 1% point increase in external debt to GDP ratio reduces GDP growth by 0.05 % points. Fosu (1996) examined the effect of external debt on economic growth in SSA countries for the period 1970 to 1986 covering sample of 26 countries using ordinary least square regression technique of estimate. The result of the study revealed a negative relationship between debts on economic growth in SSA countries. In another study, Fosu (2011) examined 35 SSA countries span 1980-1990 to explore the effect of external debt on economic growth in sub-Saharan Africa applying OLS approach, the result shows a negative nexus between external debt and economic growth. However, the impact is less felt on investment. Contrarily, Ijirshar, Joseph and Godoo (2016) in their analysis investigated the effect of external debt on economic growth in Nigeria for the period 1981-2014 applying the ADF stationarity test and Johansen Cointegration test technique. The authors found that positive relationship between external debts on economic growth in Nigeria in the long-run. But external debt servicing had both long-run and short-run negative effect on economic growth.

However, Ayadi & Ayadi (2008) investigated the impact of external debt and debt servicing on economic growth comparing South Africa and Nigeria by applying the OLS and generalized square regression technique. The authors in their analysis used sample period of 1980 to 2007 and the result of the study shows that external debt had a positive effect on Nigerian growth but at a point of threshold, it becomes negative. However, South Africa external debt on growth seems to perform better on economic growth. In a separate study, Burhanudeen, Muda, Nathan and Arshad (2017) employed data on Malaysia for the period 1970 to 2015 applying the auto regressive distributed lag model, the result of their study shows a positive relationship between external debt and growth in short and long run. However, the result further shows a uni-directional relationship running from external debt to economic growth in Malaysia. Ali & Mustapha (2012) in a study used time series data span from 1970 to 2010 to estimate the effect of external debt on Pakistan economic growth applying Johansen (1988). The result of the study shows that external debt had a negative long run effect on economic growth. For instance, a one percent point increase in external debt as percentage of GDP reduces the GNP by 0.42%. The result also reveals a negative and significant short run relationship between external debt and economic growth. In the same vein, Siddique; Ullah, and Ul-Haq (2017) used data on Pakistan economy span from 1975-2015 applying the

ARDL technique of estimation. Result of the study depicts a negative and significant effect between external debt and economic growth in Pakistan economy.

Daud and Podivinsky (2012) investigated the effect of external debt on economic growth for 31 developing countries for the period 1970 to 2005 using GMM-system. The result of the study posit that external debt negatively affect economic growth. Were (2001) investigated Kenyan economy on the effect of external debt and debt servicing on growth spanning 1970-1995. The result of the study indicates that external debt stock had a negative impact on both economic growth and private investment. Debt servicing had no severe effect on growth but severely affects investment negatively. Yeltulme and Kwesi (2017) in their study investigated the effect of real exchange rate on economic growth in Ghana using time series data set spanning from 1984 to 2014 and applying the ARDL model. The result of the study indicates a positive and statistically significant relationship between real exchange rate and economic growth at the time period of study. In another study Bo (2014) applied the Cointegrated VAR (CVAR) model to investigate empirically the nexus between Real Exchange Rate (RER) and economic growth in China span 1994 to 2012 and the result revealed that there is no significant long run relationship between real exchange rate and economic growth.

3. Methodology

Data sources

This study employed the panel data set sourced from World Data Indicator (WDI) for the period 2009 to 2019. A panel of 13 SSA countries was obtained as sample countries for observation, and the rationale for using the secondary data source is due to availability of data in form of non-probability sampling technique. The rationale of using large number of country groups is to solve the issue of country specific effect problem and endogeneity related issue common with panel data estimation.

Empirical Model and Description of Variables

This study used a modified model of Cunningham (1993) which is expressed in form of production function:  $Y = f(HC, K, T, L, ED)$  ..... 1

In the case of Cunningham (1993) model, the dependent variable GDP per capita is used as a proxy of economic growth (Y) and employed by Siddique and Majeed (2015), Siddique et al. (2016), Siddique and Ul Haq. However, the explanatory variables are gross fixed capital formation (K), human capital (HC), labor force (L), and external debt (ED) respectively.

$Y_t = \beta_0 + \beta_1 HC + \beta_2 K + \beta_3 L + \beta_4 ED + \beta_5 T + \epsilon_t$  .....2

So also, considering the unique study by study by Beck, Levine & Loayza (2000), and Calderón and Servén (2004) which allows the use of lag value of the dependent variable to be used to solve for endogeneity and unobserved country specific effect commonly associated with panel data estimation. This study employs the GMM estimation.

To specify the dynamic model, we have

$$\ln Y_{it} = \phi \ln Y_{it-1} + YZ'_{it} + \beta X'_{it} + d_t + \varepsilon_{it} \dots \dots \dots 3$$

Z' Implies control variables, X' implies explanatory variables  $\ln Y_{it-1}$  is lagged value of dependent variable.

The differenced GMM is expressed as:

$$\ln Y_{it} = \phi \ln Y_{it-1} + YZ'_{it} + \beta X'_{it} + d_t + \varepsilon_{it} \dots \dots \dots 4$$

$$i = 1, 2, \dots, N; t = 1, 2, \dots, T$$

The implication of the above differenced GMM model is that, if the dependent variable is close to random walk for instance ( $\Phi > 1$ ) that is the lagged dependent variable is moving toward one (1). The Difference GMM estimation will not yield a robust estimate rather a biased and inefficient estimate and consequently could be acute when the time panel is short Blundell and Bond (1998).

The significant coefficients in the GMM estimations are important tool for determining long run equilibrium. The long-run coefficients were generated through short-run significant coefficient of ECM. Thus, the long-run effects for the  $K^{th}$  parameter is computed as

$$\beta_k + (1 - \Phi) \dots \dots \dots 5$$

The system GMM is preferred in most respect; firstly, the static model does not capture short and long-run relationship. Secondly, the Sys-GMM estimator captures the persistent nature of regressors on the dependent variable which also addresses the problem of omitted variables, measurement error, endogeneity, and country-specific heterogeneity (Adeleye; Osabuohien & Bowale, 2017). To produce robustness of estimation, this study applies the consistent system-GMM estimator which is assessed by two specification tests.

Firstly, the Hansen test of over-identifying restrictions tests is for the overall validity of the instruments. Secondly, the other test examines the null hypothesis that the error term is not serially correlated. Failure to reject both null hypotheses gives support to the model (Arellano and Bond 1991; Arellano & Bover 1995; Blundell & Bond 1998) cited in Adeleye *et al* (2017).

*Variable measurement*

Gross fixed capital formation (formerly gross domestic fixed investment) includes land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways, and the like, including schools, offices, hospitals, private residential dwellings, commercial and industrial buildings. According to the 1993 SNA, net acquisitions of valuables were also considered capital formation (see World Development Indicators, 2020).

Unemployment refers to the share of the labor force that is without work but available for and seeking employment (see WDI, 2020).

GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant local currency (see WDI, 2020)

Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments (see WDI, 2020)

GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars (see WDI, 2020)

Real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs (see WDI, 2020)

Total external debt is debt owed to nonresidents repayable in currency, goods, or services. Total external debt is the sum of public, publicly guaranteed, and private nonguaranteed long-term debt, use of IMF credit, and short-term debt. Short-term debt includes all debt having an original maturity of one year or less and interest in arrears on long-term debt. Data are in current U.S. dollars (see WDI, 2020).

#### **4. Results**

The result shown in table 1 column 1 indicates the baseline model and it revealed that the lagged value of the dependent variable has a statistical significant relationship with the dependent variable explaining that the previous period had an impact on current period. From the analysis of differenced GMM estimation, it posit that lag value of GDP per capital i.e. previous period had a positive and statistical significant impact on current economic growth from the baseline model 0.356 at 1% level of significance in the short run.

The outcome of previous period on current period is also evident and persistent across model 2-6 showing that the lagged value of economic growth has a positive and statistical significant impact on current economic growth at 1% level of significance. Similarly, External Debt has a positive and significant at 10% across model 1, 2, 3, 5, 6; but negative at 10% level (-0.0198). Gross fixed capital formation is positive in model 3, 4, 5 at 10% level of significance.



The coefficient of real exchange rate depicts a negative and statistical significant impact on economic growth across all models. AR (2) is not significant across all models indicating that the results do not suffer from second-order serial correlation. The Hansen test statistics also indicates that, the instruments are not over-identified

**Table 1: Differenced GMM**

variable	1	2	3	4	5	5	6
lnGdpper_1	0.3567*** (0.07)	0.3567*** (0.07)	0.3223*** (0.09)	0.3218*** (0.06)	0.2541*** (0.08)	0.3200*** (0.06)	0.3200*** (0.06)
lnexdebt	0.0342* (0.16)	0.0493* (0.09)	0.0647* (0.10)	-0.0198* (0.15)	0.0304* (0.08)	0.0493* (0.07)	0.0493* (0.07)
lngfcf	-0.0148* (0.10)	-0.0108* (0.10)	0.0104* (0.09)	0.0202* (0.10)	0.0377* (0.09)	-0.0104* (.04)	-0.0108 (0.04)
Real exch	- 1.1742*** (0.14)	-1.1981*** (0.11)	- 1.1604*** (0.10)	- 1.1264*** (0.13)	- 1.1546*** (0.11)	- 1.1981*** (0.08)	-1.1981 (0.08)
No. of Obs	90	90	90	90	90	90	90
Time	Yes	Yes	Yes	yes	yes	yes	Yes
Dummies							
Number of Instruments	33	12	12	32	11	12	12
No of groups	13	13	13	13	13	13	13
F Statistic	22.59	37.86	24.97	24.97	33.62	62.36	330.12
GMM	1	1	1	1	1	1	1
Instrument Lag							
AR(1)	0.997	0.799	0.895	0.889	0.381	0.724	0.718
AR(2)	0.225	0.225	0.251	0.249	0.248	0.025	0.021
Hansen test	1.000	0.430	0.515	0.987	0.411		

*Notes: \*\*\* \*\* \* denotes 1% 5% 10% statistical significance. Z statistics (in parenthesis)*

*Source: Authors computation*

**System GMM**

It is pertinent to note that GMM estimation relates to short run analysis. In essence, the long run relationship can be generated from the significant coefficients. The result on table 2 posit a positive and statistical significant relationship between lagged value of economic growth and current economic growth at 1%. This is evident across all models except in 2 where it depicts a negative and statistical significant relationship (-0.0298) at 1% level.

External debt indicates negative at 5% level of significance in model 1 and 2 given the values -0.2865 and -0.2020 respectively. The coefficient gross fixed capital formation has a positive sign (0.2356) at 5% level in model 2 and in model 6 (0.1153) at 5% level respectively. Real exchange rate has a negative and statistical significant relationship with economic growth at 1% level of significance across all models of specification AR (2) statistics indicates that the models do not suffer serial-order correlation because none of the AR (2) is significant across all models of specification. The Hansen test statistics also shows that, those instruments used are not over-identified.

Table 2.:System GMM

variables	1	2	3	4	5	6
lngdpper	0.1826** (0.21)	-0.0298*** (0.17)	0.4702*** (0.11)	0.3876*** (0.12)	0.1689*** (0.11)	0.2662*** (0.13)
lnexdebt	-0.4040** (0.55)	-0.2865** (0.20)	-0.0058* (0.15)	-0.0116* (0.13)	-0.0398* (0.17)	0.0338* (0.07)
lngfcf	-0.0085* (0.22)	0.2356** (0.19)	0.0254* (0.09)	0.0435* (0.11)	0.0078* (0.22)	0.1153** (0.09)
lnrexr	-1.5416*** (0.44)	-1.4773*** (0.36)	-0.7860*** (0.15)	-0.8562*** (0.16)	-1.2958*** (0.13)	-0.9566*** (0.11)
No. of Obs	90	90	90	90	90	90
Time	Yes	Yes	Yes	yes	yes	Yes
Dummies						
Number of Instruments	28	7	33	12	15	20
No of groups	13	13	13	13	13	13
F Statistic	116.49		186.64	180.21		137.80
GMM	1	1	1	1	1	1
Instrument Lag						
AR(1)	0.418	0.171	0.398	0.608	0.191	0.711
AR(2)	0.200	0.442	0.771	0.500	0.198	0.484
Hansen test	1.000	0.726	0.999	0.354	0.657	0.985

Notes: \*\*\* \*\* \* denotes 1% 5% 10% statistical significance. Z statistics (in parenthesis)

Source: Authors computation

Some reasons may attribute to insignificance of coefficient external debt. Firstly, SSA debt is unsustainable with huge risk, poor management and inefficiency which have been the norms of every regime. Thus, it is not surprising that despite the acute debt profiles, it lacks the strength to drive growth. Secondly, the poor allocation of resources to real sector capable to spur growth also attributes to insignificant external debt growth nexus .to further affirm this, the coefficient gross fixed capital formation also exerts much significance on growth.

To ensure robustness of the GMM estimate, a cursory estimate at lag 2 is essentially important in Table 3. The result is not different from the initial system GMM estimation at lag one in Table 2. The difference is the significance of lag GDP per capital at 5% in model 1 and in System GMM robust estimation; it's 5% in model 3. All lagged values across all models are significant at 1% level in the short run. The significance of the coefficient external debt in robust estimation does not improve comparatively to initial system GMM although varies across model of specification. The parameter real exchange rate has the same sign and level of significance comparatively to System GMM in table 2.

Table 3: Robustness of System GMM check

Variables	1	2	3	4	5
Loggdpper_2	0.3241*** (0.16)	0.2542*** (0.08)	0.2712** (0.15)	0.2967*** (0.10)	0.2891*** (0.1101)
Logexdebt	0.0679* (0.41)	0.0325* (0.14)	-0.0295* (0.18)	0.0056* (0.11)	-0.0090* (0.13)
Loggfcf	-0.2090** .2874494	0.0558* (0.16)	-0.0596* (0.14)	0.1052** (0.11)	0.1162** (0.12)
Logrexr	-1.4214*** (0.22)	-1.0701*** (0.18)	-1.5335*** (0.59)	-0.9985*** (0.14)	-1.0316*** (0.15)
No. of Obs	77	77	77	77	77
Time Dummies	Yes	yes	Yes	yes	Yes
Number of Instruments	21	11	14	19	21
No of groups	13	13	13	13	13
F Statistic	11.37	36.31	3.25	35.16	32.49
GMM	2	2	2	2	2
Instrument Lag					
AR(1)	0.132	0.064	0.145	0.114	0.117
AR(2)	0.536	0.675	0.721	0.407	0.411
Hansen test	0.996	0.325	0.886	0.711	0.136

Notes: \*\*\* \*\* \* denotes 1% 5% 10% statistical significance. Z statistics (in parenthesis)

Source: Authors computation

## 5. Conclusion

Considering the mixed evidences in the literature on the nexus between external debt and economic growth nexus in SSA countries, this study investigates the impact of external debt on economic growth in SSA covering the period 2009 to 2019. A panel of 13 SSA countries is employed and the System GMM is employed. The result of the study shows that, the lagged value of economic growth had a positive and statistical significant effect on current growth.

A positive but non-significant relationship exists between external debt and economic growth in SSA and this certainly may be attributed to inefficiency in the allocation of external funds to growth indicators. Real exchange rate is negative across all models of specification.

Implication for the study despite huge debt accumulation by SSA countries, has less desired impact on the economy thus SSA must as a policy concern observe regulations defined by World Bank and International Monetary Fund on risk and sustainable debt and in most cases, utilize efficiently external resources on economic indicators that drives growth.

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## **Empirical Validations of Customer's Determinants and Acceptance of Islamic Micro Finance in Kano and Jigawa States, Nigeria**

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### **Abstract**

*The aim of this research paper is to conceptualize the model in examining accessibility to fund, attitude, and knowledge as the selected determinants of customers' acceptance towards Islamic micro finance in Kano and Jigawa States, Nigeria. This study used simple random sampling technique and obtained data from 200 Islamic micro finance customers in Kano and Jigawa States. The study tests the reliability of the study measurement and explores the potential framework as a pilot study. The study found the measurements to be valid and reliable as the potential framework is conceptualized. Recommendations indicated that financiers and the general public can consider the variables and the measurements of this study to serve as a guide for Islamic micro finance towards customer's acceptance of their products. Also, agencies such as stock exchange commission, the Central Bank of Nigeria as well as other financial institutions can utilize the outcome of this study in making policies and strategies.*

**Keywords:** Acceptance, Attitude, Knowledge, Customer's, Islamic Micro Finance

**JEL Classification:** G21

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### **1. Introduction**

Microfinance has been getting wide consideration in the past few years since this mechanism is observed as one of the most significant sources in changing people's lifestyle especially the poor (United Nations World Summit Outcome Documents, 2005). This is obvious as the General Assembly of United Nations has announced the year of 2005 as the Year of Microcredit (Mahjabeen, 2008). Micro-Finance (MF) institutions refer to the organization that aimed at providing small loans to groups or individuals that are, low-income earners or neglected and cannot approach conventional banks due to lack of collaterals (Mahmood, 2019). Equally, it is viewed as inventions in micro finance appeal ethical thought in streak with the

dictates of Islam in doing business. The financial services are projected to help the poor who is living in less than five American dollars (\$5) and also offer small financial credit to the less privileged for meeting his/her need and necessity, investment needs, personal disaster, and emergencies (Rahman, 1999). It added greater visibility and attracted the interest of academic, practitioners and investors mostly in developing countries such as the most populated country in Africa called Nigeria (Usman & Tasmin, 2016; Afonso & Khan, 2019).

Nigeria is one of the West Africa countries among five (5) African continents that included West Africa, North Africa, Middle, East and South Africa (Masih, Maskey, Mussá & Trambauer, 2014). With higher number of countries that composed sixteen out of the number of fifty in the African Continent (Abdullahi, 2013; Mohammed, Aziz & Ogunbado, 2017). Nigeria being one of the most populated countries in the World that is the tenth (10<sup>th</sup>) populated nation globally with population of 202, 092,253 million people including male and female, higher than fifty (50%) belong to Islamic religion yet Islamic bank is at developing stage (Abdullahi, Ochi & Gwaram, 2013).

Furthermore, the two states (Kano and Jigawa) have larger number of population that are mostly Muslims and with higher number of poverty that need financial intervention. However, Islamic micro finance did not need interest rate as conventional micro finance do, due to prohibition of *riba* (application of interest) as revealed by the verse in the Holy Qur'an discussed (Khan, 2013). Due to that, the less privileged Muslim of the two states of the study area has the intervention of the non interest source of financing their day-day socio-economic activities and reduction of poverty. This is in line with the study of Obaidullah and Khan (2008) that described Islamic micro finance as an extreme poverty easing techniques that introduce provision of financial services to less privileged, poor people of low income as well as low economic standing that are omitted from financial system on formal bases. It is also measured as some energetic techniques for easing poverty as the system has factors that determine customer's acceptance of Islamic micro finance as dependent variable by consideration of the independent variables that includes; Accessibility to fund, Attitude and Knowledge in relation to customers which problem statement would explain further.

The understanding of Accessibility to fund, Attitude and Knowledge in relation to acceptance of Islamic micro finance remains a means for answering numerous of the challenges associated with unemployment, creation of wealth, poverty reduction, and social evils such as kidnappings, and political thugs among others. This is in line with the studies of Durotoye (2014); Egboro (2015) and Oduwale (2015) chosen that these variables are essential in both Islamic and conventional Nigerian micro financial institutions in order to resolve issues of social vices mentioned above through growing source income generation, jobs creation, and Family well-being and build assets. Thereby, this study contributes the inclusion of Accessibility to fund, Attitude and Knowledge variables as determinants on acceptance of Islamic micro finance in the two neighbor States (Kano and Jigawa) towards socio-economic growths and development of the states and Nigeria in general.

The study intend to explain the concept of Accessibility to Fund, Attitude, Knowledge and customers' acceptance of Islamic MF as well as test the selected variables validity, reliability and proposed framework.

## **2. Literature Review**

Kamal Uddin et al. (2015) examined social collateral model for Islamic micro finance and qualitative approach was used on officers and academic of micro finance institutions. The study used focus group discussions and interviews and the result shows that group pressure, culture, social capital and entrepreneurship skill are machineries of social collateral model for Islamic MF. Mahmood (2019) analyzed impact of Islamic MF on borrowers' income in Pakistan and the study used primary data with qualitative analysis, findings shows that there was a reasonable increase in the income and consumptions of the borrowers. Outcome also indicated that there is 18% average increase in the rural borrowers' income and average increase of 23% in urban borrowers' income.

Fan *et al.* (2019) examined on their study that Islamic MFIs compared to conventional have less credit risk, but less financially sustainable and profitable, less likely to mission drift and have better poverty outreach. Putri, Fithria and Kasri (2019) evaluated factors moving customer intention to seek Islamic MF in Indonesia. Researchers used sample of 160 customers from four (4) branches of the two (2) Islamic MFIs. Partial least square modelling was used and measured the effects of 5 construct (perceived behavioral control, attitude, subjective norms, religiosity & pricing). Result of their analysis shows that all the four (4) constructs have positive influence on intention to seek Islamic MF and price revealed a negative influence.

Hadisumarto and Isma'il (2010) examined the effectiveness of Islamic micro financing, and the result indicates that incentive system, construct good relationship and business control is effective in improving household income and developing micro-enterprises. Rashida and Ejaz (2019) analyzed Interest Free Micro Credit Loans (IFMCLs) in respect to female entrepreneurs of Pakistan. Researchers used both secondary and primary data where interviews and observation over an extended time frame was conducted based on qualitative research design. Data was analyzed based on organized themes and sub-themes and reviewed emerging patterns. Result revealed that IFMCLs played an important role in bringing positive transformation in the lives of borrowers. Customers narrated that flexible repayment schedule and zero interest rate are the back born of collecting loans from this source.

Shinkafi, Yahaya and Sani (2019) evaluate financial inclusion in Islamic finance, the study used qualitative method (library approach) where relevant and existing document, and the result revealed that the following factors served as imperative drives for realizing financial inclusion for rural poor, women and low income earners, these factors are legal and regulatory commitment of policy makers and regulators; robust technology; extensive public awareness of financial products and services; micro finance/credit services; financial literacy and proficiency, and lastly financial infrastructure. Iswanaji (2019) examined analysis of Accounting



Information System (AIS) using hotfit model method in Islamic MFIs of Indonesia. Research method adopted in their study was descriptive quantitative using 100 samples of accountants. Data was analyzed by SPSS 21.0 software for windows. Outcomes indicated that mobile banking is the proper instrument to enhance the quality of reporting and make accessible the services of Islamic MF to the poor in the Indonesian remote areas, the practice of using AIS in Islamic MFIs was already good; lastly, general application of AIS at Islamic MFIs of Indonesia has positive effect on enhancing the services of Islamic MFIs both in organizational accounting and individual.

Erol and El-Bdour (1989) analyzed attitudes, patronage factors and behavior of bank customers to Islamic bank. Data was collected for their study through self-administered questionnaire from cross section of middle income households, middle class, business man, lawyers and doctors. Data received were analyzed using both multivariate and univariate statistical techniques and results showed that individual effort and interpersonal contact played a significant role in the area of attracting individual to use banking services presented by Islamic bank. Also, religious motivation did not appear to be the mainstandard for selecting of Islamic banking services.

Amin, Abdul Rahman and AbdulRazak (2014) examined consumer acceptance of Islamic Home Financing (IHF). The baseline of their study is theory of planned behavior (TPB), they distributed and collected 300 questionnaires and used 278 usable one. Data were analyzed by using ordered probit model and results indicated that perceived control, attitude, Islam city of products and subjective norm are contributory in determining consumer acceptance of IHF products. For demography items, it revealed that religion, marital status, occupation and ethnic are influential, while academic qualification, monthly income and gender have little effects on the consumer acceptance. Abu-Hussin et al. (2017) determined Halal purchase intention between Muslim minorities of Singapore. Using Ajzen theory of planned behavior (TPB), the study used quantitative survey and obtained 332 observations from Muslim consumers. Data generated was analyzed and explored using regression analysis and results revealed that all TPB constructs (variables) have a significant positive effect on the intention to purchase halal certified products between Muslim minorities in Singapore.

El Ebrashi *et al.* (2017) examined what potentials does Islamic Micro Credit (IMC) have? The study used 1,125 consumers of Micro Credit (MC) in Upper Egypt and Cairo by multi stage cluster of sampling technique. Outcomes indicate the potential of Musharka mode of financing between MC borrowers in Egypt, especially in the manufacturing sector, followed by trade sector. Hoque and Awang (2019) analyzed that gender differences played moderating role in the association among entrepreneurial marketing and SMEs in Bangladesh performance. Their study used self-administered questionnaires and collected data from 220 owners of SMEs and analyzed using structural equation model (SEM). Findings revealed that there is significant and direct influence of entrepreneurial marketing on firm performance.

Sudigdo, Khalifa and Abuelhassan (2019) studied driving Islamic attributes, destination image to predict tourists and destination security guarantee. Data was collected from 200 respondents through administered questionnaire in Jakarta; data were analyzed by SEM-AMOS technique. Results indicated that there is significant impact of Islamic attribute of destination with tourist destination as mediator. AlMamum, Fazal and Muniady (2019) analyzed entrepreneur knowledge, competence skills and performance. The study used cross sectional design and collected data via structured interviews from 403 micro-entrepreneurs, and finding shows that networking entrepreneurial, skill and market orientation have a positive influence on entrepreneurial competence. Then, entrepreneurial skills, networking and entrepreneurial competence have positive influence on enterprises performance. There is a significance mediation influence of entrepreneurial competence on the association among entrepreneurial skills, networking and market orientation and enterprise performance.

#### Research Framework

The figure below represents the framework that will explain the module of this study. It also defines the relationship between acceptances of Islamic micro finance, accessibility to fund, attitude and knowledge served relationship among the variables. The study is in line with Theory of Human Behavior (THB) that explains the customer behavior on products. The human behavior theory has also selected and interrelate with one another and as well their surrounding through lively and variable business of Islamic MF. Figure 2.1 below offer description of the idea

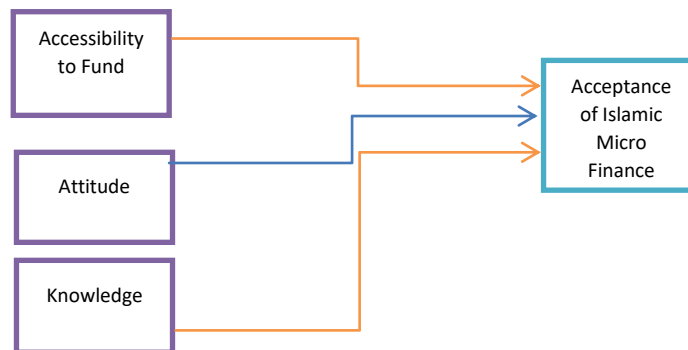


Figure 1: Conceptual Framework

Theoretical framework above clarifies the existence of direct relationship between accessibility to fund, attitude and knowledge as independent variables and acceptance of Islamic MF as the dependent variable. The construction demonstrates that accessibility to fund, attitude and knowledge could be the predictors of acceptance of Islamic micro finance based on the related works such as (Hulme et al. 2012; Kleijnen, Ruyter & Wetzels, 2007; Nagy, Carlisle & Goodwin, 2014) and Theory of human behavior (THB) is the underpinning theory of this study.

### 3. Methodology

Kano and Jigawa States are two of seventh North Western State of Nigeria in which Kano were ranked the first out of 36 state of Nigeria in term of population and among the top in Agriculture, Trade and Industry with total coverage area of 20,131 kilometer square (KM<sup>2</sup>) and equal to 7,773 square meter (SQ M) and population of 9,401, 288 people. Whereas, Jigawa State has cover 23,158 kilometer square (KM<sup>2</sup>) equivalent to 8,940 square meter (SQ M) as well the state ranked 8<sup>th</sup> of 36 State of Nigeria with 4,361,002 estimated population conducted in 1996 (2006, Census; (Mohammed, Adamu, Sunusi&Damamusau, 2020).

This research applied quantitative research method to access the connection between accessibility to fund, attitude, knowledge and acceptance of Islamic micro finance. The researcher collected the data from customers of small and medium enterprises such as block industries, poultry farmers, groundnut oil makers, tailoring services and many others. The research analyzed the data collected through the usage of SPSS and partial least square structural equation modelling (PLS-SEM). Likewise, confirmed the reliability frame from studying the literature as proposed (Hair et al., 2014). Therefore, the target population of this study is 1,808 small and medium enterprises (SMEDAN, 2012) in Kano and Jigawa States, in Nigeria.

### 4. Result

#### *Reliability analysis*

Reliability is defined as the score in which the items that make the scale come together to display that all items are evaluating the same underlying variable. It also displays the level in which is free from random error. The reliability scales are test and retest which is also mentioned as temporal consistency and internal stability. Though, as haggard by George (2003) mentioned that value for Cronbach's alpha is 0.60. Cronbach's coefficient is finest frequently used in SPSS. It gives a proposal of an average correlation among individual and every item that institute the scale. Value going from 0 to 1 having better value displays better reliability and result better than 0.70 displays the worthy validity and reliability of measures. The underneath table 1 pronounces the value of Cronbach's alpha of the entire variable going from 0.9 and composite reliability of 0.9 and above which is near to one meaning the scale used measured is highly reliable for this study.

Table 1: Realibility Test

	Items	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
ACC of IMF	22	0.96	0.96	0.52
Accessibility to Fund	11	0.91	0.93	0.51
Attitude	22	0.83	0.87	0.50
Knowledge	22	0.95	0.96	0.56

*Source: Authors' Computation*

From the table above, all the study constructs have satisfactory Cronbach's alpha. Acceptance of Islamic MF (ACC of IMF) has value of Cronbach's alpha of 0.96

and Composite Reliability of 0.96. And Accessibility to fund Cronbach's alpha value was 0.91 and Composite Reliability of 0.93. Knowledge has Cronbach's alpha of 0.95 and Composite Reliability of 0.96, on the other side Attitude variable has Cronbach's alpha value of 0.83 and Composite Reliability of 0.87. Furthermore, all variables have satisfactory average variance extract of more than 0.4.

#### *Findings*

This outcome of this study revealed by the literature indicated the significant validity between accessibility to fund, attitude, knowledge, and acceptance of Islamic micro finance. Further pilot test of the reliability and validity of the variables revealed the standardization of the study dependent and independent variables, likewise the study framework.

#### **5. Conclusion and Recommendation**

The conclusions of this research reported that Acceptance of Islamic MF has value of Cronbach's alpha of 0.96 and Composite Reliability of 0.96; Accessibility to fund 0.91 and 0.93; Knowledge has 0.95 and 0.96; Attitude has 0.83 and 0.87 respectively. Therefore, this study indicated that the positive relationship between the study variables and framework would boost the financial institutions, corporate bodies and Stakeholders. Furthermore, both local and foreign shareholders would gain from the research by seeing the most fitting factor that could make customers accept the Islamic MF.

The study suggested that shareholder or investors can consider this research to help as direction before they could capitalize their savings on IMF so that they minimize risk and maximize their returns. Policy makers such as Central Bank of Nigeria (CBN), government as well as security and exchange commission (SEC), can use the results to make clear economic policies on financial sectors derived from the research.

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## **Corruption in Nigerian Parastatals is an Impediment to Socio-Economic Development: Case of Ajaokuta Steel Company Limited (ASCL)**

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### **Abstract**

*The aim of this study is to conduct an in-depth study on a single case, exploring ASCL's failure to contribute to Nigerian socio-economic development. Ajaokuta Steel was substantially completed in the 1990s but unfortunately progressed no further. The aim of establishing Ajaokuta Steel Company was to take the lead of industrialising, developing, and taking Nigeria and Africa from poverty and unemployment. Questionnaire, interviews, and documents were used to gather data. The interviews from the case site and stakeholders were analysed from the interview transcript and data from the questionnaires were analysed using test statistics. The use of several data collecting methods was to achieve triangulation. The results of the interviews, documents and questionnaire indicated a lack of political will, international and local politics, corruption, military interventions in politics, the location of Ajaokuta Steel, patronage, ineffectiveness of anti-corruption agencies and the practice of abandonment of projects, as reasons why Ajaokuta Steel has not been fully completed. Theoretical framework based on neopatrimonialism was used to guide the researcher in the empirical work and in the study. This is because there is no known use of neopatrimonialism as a theory with parastatal in Nigeria known to the author. The originality of this study also lies with the opportunity of gaining access to interview the staff of ASCL which others found difficult to undertake. This is a huge breakthrough as that is rare in Africa where there is a huge public sector investment and that investment is moribund.*

**Keywords:** Neopatrimonialism, Political Will, Industrialising, Triangulation, Corruption

**JEL Classification:** O17

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### **1. Introduction**

Many African countries established parastatals immediately after they obtained independence (Etukudo, 1997), ostensibly consistent with the vision of external agencies to see socio-economic development in these countries (see UNDP, 1997). Parastatals also known as State Owned Enterprises (SOEs) are managed by the Chief Executives appointed by the government and are established ostensibly to



provide social goods and services for collective and public use rather than for private gain (Adeyemo & Salami, 2008; Ezzamel & Willmott, 1993; Mayston, 1993). Some are established essentially to make profits, others were established to provide essential services at a minimum cost to their citizens. They were separated from the regular bureaucratic ministry to enable them enjoy independence, take quick decisions and compete with their counterparts in the private sector (Babaita, 2001; Mwaura, 2007).

However, Studies (Etukudo, 1997; Mwaura, 2007; Needle, 2010; Ugorji, 1995) have shown that commercial parastatals have failed to make profit but have continued to draw resources from public funds. These studies have highlighted that: parastatals have disregarded the views of relevant stakeholders; government has dictated pricing policies to control inflation thereby distorting the market; governing board members have been mainly failing politicians; parastatals are bedevilled with inappropriate performance measurement and reward system, making them unattractive to ambitious professionals; parastatals suffer from a lack of management independence; and the decision-making process follows bureaucratic procedures which are slow and complex.

The period of military rule in Nigeria witnessed a massive neglect of a well-contrived State Owned Enterprises (SOEs). For instance, about 11,866 parastatals including Ajaokuta Steel Company Limited (ASCL) established by the Nigerian government between the period of independence and 1999 were abandoned by the Federal Government of Nigeria (FGN) (El-Rufai, 2012). For instance ASCL was abandoned when President Shehu Shagari left the office in December 1983 by the military-led government of General Muhammadu Buhari. Also Bakre and Lauwo (2016) report that over \$10 billion was borrowed and invested in SOEs between the period of independence in 1960 and 1999 resulting in over \$20 billion foreign debts for Nigerian taxpayers. Revenues from oil and gas were directed to the servicing of the debts. The debt burden led to the abandonment of SOEs and sales of some at a giveaway price to cronies (Bakre & Lauwo, 2016).

The aim of this study is to conduct an in-depth study on a single case, exploring ASCL's failure to contribute to socio-economic development. ASCL was established in 1979, and certified 98% completed in the 1990s but has still not been fully completed to start the production of steel. Much publicity has been given to an ASCL issue on the pages of Nigerian daily newspapers and official reports which have carried captions such as: "World Bank cautions Nigeria on outmoded steel mill" (Botha, 2002); "Ajaokuta: The story of a deadly conspiracy" (Samuel, 2003); "Mega Fraud at Ajaokuta" (Melah, 2007); "Ajaokuta: When a challenge defies a nation" (Ezeobi, 2008); "Massive Looting of equipment and property of Ajaokuta Steel Company Limited and National Iron Ore Mining Company, Itakpe" (House of Representatives, 2009); "Nigeria: Why Ajaokuta Steel must be completed" (Inabo, 2010); "We can fix Ajaokuta Steel, NIOMCO with N650m" (Ofikhenua, 2010); and "Ajaokuta, the 31-yr jinxed company" (Alao, 2010). The above captions suggested there was a particularly serious and pertinent case to explore more in-depth into ASCL's case.

Most literature on governance parastatals in Africa (Etukudo, 1997; Mwaura, 2007; Ugorji, 1995) attribute corruption, inefficiency, and lack of profit as the reasons for SOEs' non-performance and recommend denationalisation of parastatals. They ignored the benefits of SOEs to the general public (Uddin & Hopper, 2003). This paper argues that instead of denationalising, appointments into SOEs should be based on integrity, faithfulness, honesty and one's previous records or experience. This is because both the private sector and public sector are disposed to corruption (Anwar & Sam, 2006; Klitgaard, 1997; Ugorji, 1995; Wanyama *et al.*, 2009). Privatisation cannot stop corruption (Fitzsimons, 2009). Moreover, difficulty in having access to SOEs in Africa makes governance in parastatals to be under researched (see Agbiboa, 2012; Etukudo, 1997). The theory of neopatrimonialism was used in explaining the reasons why there is socio-economic underdevelopment and political problems in developing nations (Roth, 1968).

The study is further divided into nine sections. Section two gives more contextual insight into the case of ASCL. Section three elaborates the theoretical framework while sections four and five examine corruption and socio-economic development respectively. Section six discusses the research methods. Sections seven and eight present and discuss the empirical findings respectively; while section nine provides the conclusions to the study.

## **2. The Ajaokuta Steel Company Limited (ASCL) Case**

Steel is the key to industrialisation, economic development and the foundation of human advancement of any nation. Steel company quickens economic, social and political growth; it enhances national income earnings; bring important infrastructure and wealth to the rural areas and the per capita consumption of steel is a major index of national prosperity (Federal Republic of Nigeria, 2008). Per capita consumption of steel is one of the parameters for measuring development of a country (Mohammed, 2002a). A nation's military, economic, political powers and technological development are measured by the output and per-capita consumption of steel.

The plan to establish a steel industry in Nigeria started in 1958 before independence (Mohammed, 2002a; Okafor, 2007). However, Western experts back in the 1960s advised Nigeria to concentrate on agriculture (Agbu, 2007; Mohammed, 2002a). This is because, according to these experts, there is high cost of technology and Nigeria lack the accompanying infrastructural facilities for steel industry; lack of skilled people to start a full-scale steel industry; and lack of local market for steel products (Agbu, 2007). However, Nigeria's ostensible quest for development and well-being of her people led to her inviting Soviet experts in 1967 to help establish an Integrated Steel Company at Ajaokuta leading to the feasibility study in 1970 by Soviet steel experts (Agbu, 2007). This decision was taken by the military-led government of General Yakubu Jack Gowon (in power from 1966-1975).

Nigeria Steel Development Authority (NSDA) was established on the recommendation of the Soviet steel experts in 1971, the experts were expected to plan, construct and operate the steel plants; carry out geological surveys,

metallurgical research, study the market, and undertake training of staff overseas (Agbu, 2007; Federal Republic of Nigeria, 2008; Mohammed, 2002a). Under the military government of General Olusegun Obasanjo, NSDA was dissolved by National Steel Council Decree No. 60 of 18 September 1979. It was this dissolution that gave birth to Ajaokuta Steel Company Limited (ASCL), to be supervised by the Ministry of Mines and Steel Development.

Ajaokuta Steel is an industrial giant meant to take the lead of industrialising, developing, and taking Nigeria and Africa from poverty and unemployment. Ajaokuta Steel Company Limited (ASCL) is located at Ajaokuta, in Kogi State, Nigeria. ASCL was established in 1979 by the Federal Government of Nigeria (FGN) to earn foreign exchange, stimulate economic growth and to provide materials for infrastructural development, technology acquisition, as well as to generate employment and training of labour, income distribution and regional development (Miachi, 2001).

ASCL has 17 major units which include: Sinter Plant, Coke Oven & By-Product Plant, Iron Making Plant (Blast furnace), Steel Making Plant, Billet Mill, Light Section Mill, Wire Rod Mill, Medium Section & Structural Mill, Thermal Power Plant, Forge & Fabrication Shop, Machines and Tools Shop, Foundry Shop, Power Equipment Repair Shop, Rubberising Shop, Lime Plant, Refractory Plant, and Oxygen Plant unit (NATE, 2009). Some of these units were 100% completed but Coke Oven & By-Product Plant was 89.91% completed; Iron Making Plant (Blast furnace) was 99% completed; Steel Making Plant is 99% completed; Lime Plant was 98% completed; Refractory Plant was 98% completed; and Oxygen Plant unit was 98% completed (NATE, 2009).

ASCL was arranged to be completed in three phases. The first phase production capacity was 1.3 million tonnes annually to produce long steel products for construction industry. The second phase was to produce 2.6 million tonnes annually meant for the production of flat steel products for manufacturing industry. The third phase was 5.2 million tonnes annually for the production of both long and flat of steel products (Agbu, 2007; Mohammed, 2002a).

However, ASCL which was certified by experts to be 98% completed in the 1990s (ASCL website, NATE, 2009) had not started the production of steel. The assessment of the state of readiness of ASCL carried out by the builder (Tyazhpromexport [TPE]) of ASCL in 2000 gave an estimated amount of US \$460 million as the money needed to complete, rehabilitate, and commission the first phase of the steel plant (Agbu, 2007). In 2010, the former Minister of Mines and Steel Development, Mrs Alison Madueke, provide the missing infrastructures needed to complete ASCL and these include: completion of a rail line from Ajaokuta to Warri, dredging of the River Niger, linking of the Dolomite (Osara) and Limestone (Jakura) mines by rail, dredging and lowering of the Escravos bar (Warri), and the completion of the super-concentrate plant and other auxiliary units (Madueke, 2010). A steel company like ASCL cannot, however, start production of steel until all the units are 100% completed and the missing infrastructures are properly put in place (Okoroanyanwu, 2008). The uncompleted units and the

missing infrastructures represent 2% as put by experts (NATE, 2009) to start production of steel at ASCL.

The first phase of 1.3m tonnes production capacity of steel per annum was halted in late 1983 when Shehu Shagari was ousted by General Muhammadu Buhari and ASCL was temporarily abandoned. The first phase again almost stopped completely in the mid-90s due to political instability (shifts of military government), interference by the government and poor public services (Mohammed, 2002a, 2002b). ASCL was given in concession to Solgas Energy Limited (SEL) on 13 October 2003 (under a civilian government) in order to rehabilitate, complete, commission and operate the Steel Plant and recoup its investment within a period of 10 years, with the concession renewable for another 10 years (Agbu, 2007). SEL could not secure the funds required to reactivate and complete ASCL as such resulting in the termination of the contract in August 2004 (Agbu, 2007). On 13th August 2004 the FGN, under the same civilian government, entered into another agreement with Global Infrastructure Holdings Limited (GIHL) for the reactivation, completion and operation of the ASCL (Agbu, 2007; Mohammed, 2008). The concession agreement was terminated by the FGN under a new civilian government in April 2008 due to poor performance and failure by GIHL to comply with the major provisions of the agreement (Mohammed, 2008). Following this termination, the FGN approved the constitution of an Interim Management Committee (IMC). The IMC was dissolved and a sole administrator appointed for ASCL under a further new civilian government on 14 November 2012 (Ugeh, 2012).

Neopatrimonialism provides substantive critical framework for analysing the condition of ASCL. The next section discusses neopatrimonialism as the theoretical framework of this study.

### **3. The theoretical framework: a critical working of neopatrimonialism**

The study used the theory of neopatrimonialism which relates to under-development. The theory provides a substantive critical framework for analysing the condition of ASCL.

Neopatrimonialism is a hybrid word. *Neo-* here denotes *legal-rational bureaucratic authority* in relation to patrimonialism (Erdmann & Engel, 2007). *Legal-rational bureaucratic authority* is obedience not to a person but to an office as spelt out in the rules and other procedures governing an organisation (Wren & Bedeian, 2009). Weber called this *bureaucracy* and described it as:

*a management approach based on formal organisational structure with set rules and regulations that relies on specialization of labour, an authority hierarchy, and rigid promotion and selection criteria ...an embodiment of efficiency, precision, speed, unambiguity, continuity, unity, and strict subordination (Ivancevich et al.).*

*Patrimonialism* is where loyalty is owed to those in authority and the exercise of public authority is to serve the personal pleasure of those in authority (Erdmann & Engel, 2007; Ikpe, 2000). Patrimonialism encompasses two dimensions (Erdmann

& Engel, 2007; Roth, 1968): *Traditional authority* which means authority that comes from tradition and custom based on hereditary succession to the throne and *Personal authority* which means loyalty based on material incentives and rewards. Under patrimonialism, the ruler is the owner of the citizens and whatever they own (Bovens, 2007; Dubnick, 2002). So there is no difference between the public and private realms as political and state offices are regarded as family fiefdoms operating through patron-client networks (Ikpe, 2000; Johnston, 2015). Patrimonialism is defined as a social and political order where the patrons secure the loyalty and support of the clients by bestowing benefits to them from own or state resources (Nawaz, 2008). The joining together of neo and patrimonialism gives rise to neopatrimonialism. The hallmark of African regimes is neopatrimonialism where leaders lead by personal discretion rather than following the rule of law or ideas where people have respect for persons more than the office he/she occupies; and leaders occupy offices to acquire personal wealth and status rather than performance (Bratton & Van de Walle, 1994; Wren & Bedeian, 2009). Thus, neopatrimonialism can explain why there is under-development, economic, and socio-political problems a society (Roth, 1968; Erdmann & Engel, 2007). Nawaz (2008) defines neopatrimonialism as a system of governance where the formal legal-rational state apparatus co-exists and is supplanted by an informal patrimonial system of governance. Erdmann and Engel (2007) maintain that neopatrimonialism makes the patrimonial authority to penetrate the legal-rational bureaucratic authority and “twists its logic, functions and output”. which is a threat to the society and can lead to underdevelopment. Clapham (1985) defines neopatrimonialism as a form of organisation in which relationships of a broadly patrimonial type pervade a political and administrative system which is formally constructed on rational-legal lines and officials hold positions in bureaucratic organisations with powers which are formally defined and exercised these powers as far as they can, as a form not of public service but of private interest.

Neopatrimonialism has the following characteristics: (i) *Clientelism*: This is a relationship that results in give and take of public resources between the *big man* and *small man* for their personal benefits (Le vine, 1980); (ii) *Patronage* is a relationship that results in the distribution of favours to groups by leaders (Erdmann and Engel, 2007); (iii) *Presidentialism* is delegating only trivial decision-making functions by leaders to subordinates while they keep important ones to themselves (Bratton and van de Walle, 1997); (iv) *Nepotism* means giving appointments and promotions to those who the leaders have relation with or are familiar with (Erdmann and Engel 2007); (v) *Prebendalism* is when leaders take their political offices as inheritance and use personal discretion in decision making (Ikpe, 2000); (vi) *Corruption* is the miss-use of authority given to someone for personal gain (Dike, 2005); and (vii) *Ethnicism* is being loyal to one’s ethnic group than one’s country (Agbibo, 2012).

The decision to use the theory of neopatrimonialism as lens to capture why there is stagnancy in Nigeria’s socio-economic development is as a result of Transparency in International (TI) constant rating of Nigeria as one of the most corrupt countries of the world (see TI from 2010 - 2016). Another reason why neopatrimonialism is

used for the present study is because of the saying that Nigeria and indeed Africa is very rich in both human and natural resources but most of her citizens are living in abject poverty (Hope, 2005; Lawal, 2007; Uneke, 2010).

According to some commentators, African development, governance, and accountability are threatened and affected by neopatrimonialist supremacy (Akokpari, 2004; Erdmann and Engel, 2007). Neopatrimonialism creates fiscal crises thereby making development difficult and also creates personal loyalty leading to undue favour to some people (Bratton and Van de Walle, 1994). The transfer of state resources to supporters due to personal loyalty leaves opponents in poverty thereby leading to societal crises and preventing honest people from climbing to power. This affects the socio-economic development of a country (Bratton and Van de Walle, 1994; Nawaz, 2008). Neopatrimonialism provides limited accountability, destroys democratic accountability mechanisms, monopolises government power, government in power controls the judiciary, limits access to resources and prevents the State from collecting her full revenue through taxes. This inability of the state to collect her full revenue is so because the appointment of revenue officers is based on patronage to make them accountable to their patrons (Nawaz, 2008; Soest *et al.*, 2011). Neopatrimonialism makes leaders run offices as family fiefdoms and makes it difficult for leaders to maintain proper books of accounts that will enhance accountability (Johnston, 2015). Neopatrimonialism makes the president to be above the law enjoying immunity and controls the state resources as if they were his own properties by jettisoning the state budget. Moreover, during the military regime there was bold and large scale corruption as the constitution is suspended. They rule by force (decrees), promote ethnicism and patron/client relationship, oppress opponents, disregard human rights, gag the press and do not give accounts of their stewardship to the taxpayers (Ikpe, 2000). The emphasis of neopatrimonialism on leader's personal interest in governance is important as well as the focus on corruption on the analysis of ASCL.

#### **4. Corruption**

These features of neopatrimonialism can all be seen in terms of 'corruption' in a more generic sense. Corruption, from the Latin is gotten word 'corrumpere' meaning to destroy or adulterate (Grossi & Pianezzi, 2016), is described as diverting what belongs to others for personal ends (Shleifer & Vishny, 1993). It is carried out variously: bribery, extortion, fraud, embezzlement, nepotism (Dike, 2005; Grossi & Pianezzi, 2016; Uneke, 2010) and can manifest incronyism, misappropriation of funds, procurement kickbacks (Myint, 2000; TI, 2010; Zarb, 2005). It can be perpetrated through foreign exchange malpractices including currency counterfeiting, theft of intellectual property, piracy, dumping of toxic wastes and prohibited goods, deception, money laundering, illegal arms deals, smuggling, human trafficking, child labour, illegal oil bunkering, illegal payments, narcotic drugs, illegal mining, tax evasion, rigging of elections and fraudulent business deals (Ribadu, 2006; Smith, 2007). Organisations get involved in corruption for various reasons, including to keep higher prices, sustain a market for out-dated products and continue in competitive fields (Sikka & Lehman, 2015).

Corruption's effect is considered similar however it is perpetrated. It is a departure from the usual norm involving taking over collective possessions as if personally owned (Neu et al., 2015).

Klitgaard (1997) and Transparency International [TI] (2010) describe corruption as mis using entrusted power for personal advantage. Corruption is a global problem and a signal that the political, social, economic and legal systems of a country is weak (Global Organisation of Parliamentarians Against Corruption [GOPAC], 2005; Grossi & Pianezzi, 2016). Corruption is not a native of any country, race and society but rears its ugly head in religious societies, public sector, private sector, NGOs, and international organisations (Dike, 2005; Klitgaard, 1997; Ribadu, 2009). Corruption is not only prevalent in developing countries but also common in the developed world (Neu et al., 2015; Shleifer & Vishny, 1993), e.g. the Asian financial crisis of 1997-1998 (Anwar & Sam, 2006), the Maxwell scandal in the UK (Melville, 2007; Solomon, 2010) and Enron, WorldCom and Global Crossing in the US (Yang, 2006). In Africa, for some, corruption continues because predominant African culture sanctions, condones and encourages it (e.g. Agbiboa, 2012). The African continent is rich in agricultural, mineral and human resources but often experiences corruption and neopatrimonial rule so that corruption is often because of the neopatrimonial rule, corruption has eaten deep and as such, making it the main factor of its causes of poverty (Hope, 2005; Lawal, 2007; Shleifer & Vishny, 1993; Uneke, 2010). Poverty is a challenge affecting all races but the gap between the poor and the rich in Nigeria is very wide and many trace it to corruption (see Ali-Akpajiak & Pyke, 2003).

Corruption may be classified as follows. In the first place, corruption involving a huge sum of money is called grand corruption. This involves those politicians occupying elective offices and their accomplices removing huge sums of public money from the state treasury (GOPAC, 2005; Dike, 2005). The causes of grand corruption are covetousness, desire to remain in office, campaign financing, desire to favour friends to win their loyalty and contributions to constituencies electing them (Myint, 2000). The second class of corruption is bureaucratic corruption. Bureaucratic corruption involves inducing the bureaucrat to stimulate him/her to subdue the rules and regulations for personal gain (Dike, 2005; Everett et al., 2007; Lawal & Tobi, 2006; Shah & Schacter, 2004). Another class of corruption is called electoral corruption which involves the buying of votes; forcing people to vote for a particular candidate not accepted by the people; snatching of ballot papers and boxes at gun point and judicial decision in favour of a candidate not accepted by the majority of the people (Dike, 2005). The last class of corruption is state capture/influence peddling: whereby the private sector captures State actors (legislative, executive and judiciary) for its own purpose (Shah & Schacter, 2004). Multinationals and other contractors are prone to this form of corruption to win contracts from the government, a practice which negatively affects the socio-economic development of especially the developing world (see Klitgaard, 1997; The Corner House, 2000).

Corruption is dangerous to any society as it affects its socio-economic development. It involves using the power of one's position to convert communal

wealth into one's personal assets (Lehman & Thorne, 2015). It makes the poor person poorer and the rich richer thus leading to under-development (De Maria, 2009; Englebert & Tull, 2008). It keeps nations poor thereby affecting their socio-economic development (Johnston, 2015).

For Kale (2001), corruption:

*threatens the rule of law, democracy and human rights; undermines good governance, fairness and social justice; distorts competition, hinders economic development and endangers the stability of democratic institutions and the moral foundations of society.*

Corruption makes one entrusted with power and authority to misuse it (Dike, 2005); which endangers national security, quickens international illegality and discourages foreign investment (Leiken, 1996); twists merit standards, leads to higher public procurement but lowers infrastructure quality (Everett et al., 2007); hinders national development through those having offshore accounts and redirecting attention from productive economic activities (Sturges, 2008). It also leads to discouragement and loss of professionalism by honest civil servants. Corruption perpetrated by those going into politics to acquire wealth endangers lack of trust in government on the part of international communities and honest civil servants. Some corrupt politicians are more interested in government spending that brings huge bribes. They increase project costs and re-award contracts two or more times (Uneke, 2010). This leads to increased distrust, rivalries, suspicion, selfishness and discouragement of collective action (GOPAC, 2005; Shleifer & Vishny, 1993; Uneke, 2010). Corruption leads to loss of governance, cosmetic accountability, unequal income, loss of competition and retards socio-economic growth (Grossi & Pianezzi, 2016). While African countries continue to borrow money for socio-economic development and keep on repaying debts, the money is being laundered back to the developed world by those in positions of authority (Uneke, 2010).

### **5. Socio-Economic development**

Socio-economic development here means positive increase in the standard of living of people. It may be social, economic, political, cultural, or psychological advancement of a society. A developed society then means a society where poverty, unemployment, and inequality are reduced to the barest minimum. Ighodalo (2012) describes development as empowering people to make choices, making people to participate in decisions that affect them, and to serve as the agent of change. Development is not 'Manna' [2] but got through great human efforts (Hyden, 1994 in Ighodalo, 2012). Development is to ensure that the natural resources are properly extracted and not allowed to deteriorate (see Ighodalo, 2012). Development cannot be attained in a country where there is corruption, disaster, or war.

Social development means enhancement in infrastructural facilities (good roads, rails, and housing); good health care delivery system (availability of hospitals, clinics, doctors, and drugs); and good educational system (availability of well-equipped schools, teachers, lecturers, free or affordable education) (Todaro & Smith, 2003).



Economic development means the upgrade of goods and services of the productive sector of a country (Todaro & Smith, 2003). Their study further state that economic development is the improvement in the quality and quantity of goods and services delivered to an ordinary man; while Todaro & Smith (2003) describe economic development as a means of generating and sustaining an annual increase of a country's Gross National Product (GNP). It is the change involving the advancement of people's welfare and capability in a country.

Socio-economic development is the joining together of social and economic development. The signs of socio-economic development are satisfaction of basic needs (food, clothing, and housing), enhancement of the level of employment, GDP, improvement in the levels of education and quality of life (life expectancy), increase in national self-determination by making countries to be less dependent on others, meeting the needs of the present without jeopardising the needs of the future generations, accountable government and respect for human rights, increased freedom, and participation in the decisions that affect one's life (see Ijere, 2014).

Since independence, Nigeria has often been under military rule [3], which commentators suggest has particularly served as an impediment generally to socio-economic development. For instance, commentators point to the highly militarised political system, breakdown in the rule of law, corruption, pervasive rent-seeking, weak institutional capacity for economic policy management and co-ordination, lack of accountability, inappropriate and indiscriminate allocation of funds, spending on non-productive ventures and the channelling of revenues (e.g. from oil) to military and inappropriate uses (African Peer Review Mechanism [APRM] 2009, Bamgboye, 2014). This leads us to research methods.

## **6. Research methods**

To have first-hand knowledge of what one is investigating, one has to be actively involved in the activity of what is being investigated (Burrell & Morgan, 1979). The current study used:

- (i) *Observation*-In the case site, the researcher observed administrative staff attending to their paper work while production managers sat idle in their offices. The researcher interviewed some of the idle workers.
- (ii) *Semi-structured interview*-Interviews were recorded on a voice recorder, transcribed, highlighted, presented and analysed based on the issues that emerged out of the interviews.

As the case of ASCL is sensitive, data were collected in accordance to opportunities presented and therefore interview was conducted two times. The two interviews cover the same issue and they were jointly analysed. In practice, this meant collection of data in two phases. The first visit was in December 2010 to March 2011. Sixteen people were interviewed in all. Thirteen stakeholders who are Chief Executives Officers (CEO) of parastatals who are not staff of ASCL but know much about parastatals and three ASCL management staff were interviewed. Each interview lasted for forty-five minutes and was recorded after permission was sought from the interviewee. The second visit was in December 2011 to February

2012. Seventeen people were interviewed in the second phase. Ten stakeholders and seven ASCL management staff were interviewed. In total, thirty-three respondents were interviewed and their voices recorded using a digital recorder after their opinions were sought. The recorded interviews were transcribed and the results analysed. There were also informal discussions with several people that were not recorded. This is because some people did not want their voices to be heard and declined to complete questionnaires. The breakdown of those interviewed is as shown in Table 1 below.

Table 1 List of Interviewees (first and second phases)

Interviewees' affiliations	No. of interviewees in the first phase of interviews (December, 2010 – March 2011).	No. of interviewees in the second phase of interviews (December 2011 – February 2012).	Total
Journalist	2	1	3
Civil servant	5	2	7
Human right activist	-	1	1
Legal practitioner	-	1	1
Politician	1	1	2
Political commentator, analyst and academic	1	-	1
Representative of UNDP, World Bank and non-governmental Organisation	-	1	1
Chamber of Commerce (DG)	1	-	1
Nigeria Labour Congress (NLC)	-	1	1
Academic	3	2	5
ASCL Management Staff	3	7	10
Total	16	17	33

Source: Authors' Computation

The interview schedule for the first phase of interviews has three parts. The first section of the schedule is directed to politicians from Kogi State where ASCL is sited. The second section questions are directed to other stakeholders (taxpayers/public)[4] and the third section questions are directed to the management of ASCL.

The interview schedule for the second has two parts: the first part deals with other stakeholders (community as taxpayers/public). This part of the interview is divided into five themes which are: (a) Governance and Accountability in Nigeria; (b) Governing Board of Parastatal organisations; (c) Stakeholders; (d) Perspective on governance and neopatrimonialism; (e) Ajaokuta Steel Complex. The second part of the interview schedule is meant for the management and staff of ASCL. This part is broken down into four themes: governance and accountability in ASCL, governing board of ASCL, privatisation and the ASCL stakeholders. The interview was brought to an end with the following question for both parts - other

stakeholders (taxpayers/public) and management and staff of ASCL: “what do you think should be done to bring the needed change?”

(iii) *Questionnaire Survey* -The questionnaire recipients are ASCL management and staff, politicians, lawyers, medical doctors, civil servants, Ajaokuta community, academics, labour unions, managing director of a private company, journalists and human rights activists who know much about parastatals and ASCL. The use of questionnaire for this study is the need to be anonymous in order to hide the identity of respondents, protect their jobs and personality. Some respondents who completed questionnaires did not complete the demographic aspect of the questionnaire. Fifty-one questionnaires were given out but fifty were returned. This represents about 98%. Questionnaires were also given to those persons who did not want to be interviewed but were important to this study. The breakdown of the questionnaire distributed is as shown in Table 2 below.

Table 2: Respondents of the questionnaire

Respondent	Number
ASCL Management and Staff	18
Academic	8
Journalist	4
Civil servant	12
Managing Director of a private company	1
Politician	1
Lawyer	1
Human right activist	1
Labour union member	2
Traditional ruler	1
Other	1
<b>Total</b>	<b>50</b>

*Source: Authors' Computation, 2020*

The questions in the questionnaire are grouped into A to L. Groups A to C deal with the demographic aspect. Groups D to J use 5 point Likert scale: 1: Strongly agree; 2: Agree; 3: Undecided; 4: Disagree; 5: Strongly disagree. Question K asks the respondents to comment what they think could be done to bring the needed change and Question L is: any other comment(s)?

The questionnaire was piloted among PhD students. All errors were corrected before its distribution to the stakeholders and management of ASCL. Data obtained from the questionnaires were analysed using Statistical Package for Social Sciences (SPSS). The statements in the questionnaire were on a 5 point Likert-scale. All tests and decisions in this study were based on 95% confidence level. The themes that emerged out of interviews and questionnaires administered form the basis of analysis and conclusions.

(iv) *Analysis of documents* -The following documents were collected from ASCL for this study: letters sent from the Ministry of Iron and Steel Development to ASCL, documents relating to government policies and pronouncements on ASCL.

Others are parliamentary debates on ASCL, ASCL progress reports, ASCL accounting statements, ASCL CEO's presentations to the governing board, Memorandum and Articles of Association of ASCL, internal and external documents, and labour union's documents as regards ASCL. Other documents used for the purpose of this study are newspaper reports and ASCL's website. These documents back up interviews and questionnaire to build up validity.

Mixed methods of research was adopted in order to gain the advantages of qualitative and quantitative methods of research and to support in-depth and triangulated research. To confirm research findings, several methods and sources of data can be used (Bryman & Bell, 2007; Collis & Hussey, 2014; Johnson & Christensen, 2012). This is done to reinforce confidence or credibility of research findings. The disadvantage of one method is dislodged by another method's advantage. For example, those who refused to be interviewed were more disposed to complete the questionnaire. The use of theoretical framework in this study, analysis of documents, questionnaire, and interviews confirm that triangulations have been reached. We shall now turn to empirical research findings.

### 7. Empirical Research Findings

For the purpose of analysis the interviewees were coded as follows. The 13 *stakeholders* interviewed in the first phase of interviews are coded as follows: AA1, AA2, AA3, AA4, AA5, AA6, AA7, AA8, AA9, AA10, AA11, AA12, and AA13. In the second phase of interviews, 10 *stakeholders* were interviewed and are coded as follows: AB1, AB2, AB3, AB4, AB5, AB6, AB7, AB8, AB9, and AB10.

Again, the management of ASCL interviewed were coded as follows: the three *management staff* interviewed in the first phase are coded as: MA1, MA2, and MA3. The seven *management staff* interviewed in the second phase are coded as: MB1, MB2, MB3, MB4, MB5, MB6, and MB7.

Questionnaires were given to people who declined to be interviewed but agreed to complete the questionnaires. Fifty-one questionnaires were given out but only fifty were returned; the response rate is 98 per cent. The returned questionnaires were grouped into three according to the careers and status of the respondents. The first group is the staff of Ajaokuta Steel Company limited (18 respondents representing 36%) and given the name - Group ASCL. The second group is academics and journalists (8 + 4 = 12 respondents respectively representing 24%) and given the name - Group ACAJO. The third group is made up of civil servants (12), managing director of a private company (1), politician (1), lawyer (1), human rights activist (1), labour union (2), traditional ruler (1) and other (1) = (20 respondents representing 40%) and given the name - Group CISOT. The grouping is similar to the recent study by Falgi (2009) and Wanyama (2006).

#### *Highlights of research findings*

*Steel, a life blood of a nation:* According to interviewee MB1, ASCL was established to produce steel; serve as the bed rock of Nigerian industrialization and economic development; and to provide jobs and revenue for the country. Similarly, interviewee MA1 opined that steel is a life blood of a nation and a country without steel is just like a human being without blood. Interviewee MB2 argued that a steel

company generates employment; steel products are used to produce military weapons; steel products are used for building bridges, rail tracks and houses. Other benefits of steel products are economic competitiveness, national security; and it is the backbone of bridges, skyscrapers, railroads, automobiles and appliances (Umunnakwe, 2009).

Table 3 (Sa) supports the views of the interviewees that ASCL was established to promote industrialisation, economic development and provide employment for Nigerians and beyond. Group ASCL revealed the mean of 1.12, group CISOT 1.20, and group ACAJO 1.00. Group ACAJO expressed the highest agreement that ASCL was established to promote industrialisation, development, and provide employment to Nigerians and beyond.

*Lack of Political Will.* Some interviewees argued that ASCL which was substantially completed in the 1990s has not been fully completed because, according to interviewee MA1, the priority is not there; interviewee MA2, lack of political will; and interviewee MA3 said lack of political will, international and local politics. Interviewee MA1 maintained that ASCL will be completed if FGN takes it as a priority and decides to fund it because it did borrow money from anywhere to complete the project up to 98%. “Is it because of the remaining 2% that FGN will take loan?” Interviewee MA1 asked. Interviewee AA1 remarked that for ASCL to be completed there must be political will, patriotic zeal, and commitment on the part of the government because excess revenue from the crude oil can take care of that.

Table 3: Ajaokuta Steel Complex and Neopatrimonialism

Statements	No	Overall Mean	SD	Group Means			K-W P-value	M-W P-values		
				ASCL	ACAJO	CISOT		ASCL-ACAJO	ASCL-CISOT	ACAJO-CISOT
Sa- Ajaokuta Steel was established to promote industrialisation, economic development and to provide employment for Nigerians and beyond.	49	1.12	0.39	1.12	1.00	1.20	0.17	0.40	0.26	0.10
Sb- Ajaokuta Steel is not completed because the government is not willing to complete it.	49	2.02	1.18	1.82	2.17	2.10	0.86	0.58	1.00	0.65
Sc- Government is not willing to commit more money to the multi-billion dollar Ajaokuta Steel Complex because the money will not be used for its intended purpose.	48	2.44	1.33	2.12	2.25	2.80	0.30	0.86	0.14	0.30
Sd- The Russian technology is an out-dated technology.	48	3.48	1.29	3.94	2.92	3.45	0.14	0.06	0.18	0.38
Se – The following factors affect Scio-economic development of Nigeria:	47	1.57	0.80	1.50	1.33	1.79	0.31	0.28	0.55	0.15
Se(i)- Ethnicity										
Se(ii)-Corruption	48	1.12	0.39	1.00	1.00	1.32	0.02*	1.00	0.02*	0.06
Se(iii)-Patronage	47	1.96	0.98	2.37	1.25	2.05	0.01*	0.00*	0.31	0.02*
Sf- Nigeria has adequate structure to bring fraudsters, money launderers and other economic and financial crimes offenders to justice.	50	2.34	1.27	2.94	1.92	2.05	0.02*	0.02*	0.02*	0.63

Note: Table 7.1 shows the results of questionnaires received from respondents. It reveals the statements made and the number that responded, overall mean, the number of respondents that agreed and disagreed to the statement, group means, Kruskal – Wallis (KW) p. value and Mann-Whitney (MW) p. values tests conducted. The table shows the mean responses to the statements at various levels: 1=strongly agree; 2 = agree; 3= neutral; 4 = disagree and 5= strongly disagree. A \* indicates significance at the 5% level.

Source: Authors' Computation

Statement Sb in Table 3 reveals that Group ASCL's mean equals 1.82; group ACAJO's mean equals 2.17; and group CISOT's mean equals 2.10. These mean that all the groups supported the statement with Group ASCL expressing the highest agreement that the FGN can complete ASCL if it wills. However, some respondents argued that, it is not that government is not willing to complete ASCL but when money is budgeted and released, the money may not be used for the purpose intended. This means that the money may be misappropriated. This is the statement Sc with the overall mean of 2.44.

*ASCL technology, an out-dated technology.* Interviewee AA12 said the Soviet agreed to build Integrated Steel Company for Nigeria because they were looking for a place to dump their obsolete equipment. Some of the interviewees were of the opinion that it may be that the technology paid for may not be the one supplied. Other interviewees such as interviewee AB10 believe that the machines are obsolete, ought to be upgraded, and we don't need such gigantic or massive technology. In 1990, according to interviewee AA1, Japanese experts were invited to assess the viability of ASCL. The Japanese experts suggested that the company should be dismantled for it to be revived. In 2001, Hacht Associates were invited through a privatisation agency to assess the workability of ASCL but reported that Ajaokuta was not worth it and that ASCL should be turned to a power generating plant (Ayorinde, 2012). In addition, the World Bank Chief, Nicholas Stern, in July 2002 said, Soviet-era (1970s) technology is a drain on a nation's resources (Botha, 2002). In the same vein, the United Kingdom Department For International Development (DFID) evaluated the economic viability of ASCL as marginal (Chukwu, 2013).

However, interviewees MA2 and MA3 argued that Russian technology is a rugged technology and there is no way the USSR technology can be converted into USA technology after it has been substantially completed. The problem with ASCL, according to interviewees MA2 and MA3 may be because it is a Russian technology and not western technology. The USSR technology, according to MA1 and MA2, was used to produce iron rods and wires by GIHL between 2004 and 2008 in the completed rolling units. In 2009, Nigerian Association of Technologists in Engineering (NATE) noted that technology, if it cannot meet the need of that time can be modified to suit the need of the moment and not totally jettisoned as some may suggest.

Table 3 (statement Sd) reveals that majority of the respondents disagreed with the statement that ASCL technology is an out-dated technology. The overall mean equals 3.48, Group ASCL's mean = 3.94, and group CISOT's mean = 3.45. While Groups ASCL and CISOT narrowly expressed disagreement with the statement, Group ACAJO (2.92) narrowly supported the statement.

*International and Local politics.* Interviewee AA1 stated that the world powers like USA and other European countries would not like any other products to compete with theirs in African markets. But interviewee AA13 asked "were there no international conspiracies before the company was 98% completed?" Interviewee AA6 however,

argued that what is needed is a strong political will and patriotism because competition exists in all areas of human life both locally and internationally.

The feud between Western bloc and Eastern bloc was also cited by some interviewees as the reason why ASCL was not completed. This, according to the interviewees, may be the reasons why many European countries and western agencies are describing ASCL technology as drains on resources and its economic viability as minimal. On the other hand, the former Soviet Ambassador to Nigeria, Vladimir Snegirev, in 1983 declared that:

*we agreed to build this project for your country at a time when no other country in the world wanted to” (Alli-Ballogun, 1988).*

This statement suggests that ASCL is experiencing a challenging time.

The condition of ASCL on the other hand as mentioned by the interviewees is prompted by local politics. This is because those importing steel products are afraid of being thrown out of business. All these are contributory factors working against the completion of ASCL.

*Military Interventions in Politics:* Military regimes in Nigeria, according to interviewee AA13, are responsible for ASCL problems as they do not give representation to any people. Interviewee AA13 maintains that various military regimes made ASCL a conduit pipe through which resources allocated to ASCL in the budget are siphoned. For example, a dedicated and special account amounting to \$12.4 billion being the excess revenue from the crude oil sold during the Gulf War in 1991 with the Central Bank of Nigeria (CBN) depleted to \$200 million in June 1994 (Agbibo, 2012; Apter 2005). The fund, according to Agbibo (2012) and Apter (2005) was meant for three major special development projects which are the Shiroro Hydro-Electricity project, ASCL and National Iron Ore Mining Company (NIOMCO), Itakpe. The account and its content were discovered when the FGN set up a panel headed by Dr. Pius Okigbo in 1994 to investigate the activities of the CBN and to recommend measures for the re-organisation of the apex bank (Nnochiri, 2012; Tsa, 2012). General Ibrahim Babangida, however, said that the \$12.4 billion meant for the completion of ASCL and two others was not stolen but used for regenerative investment and critical infrastructure such as building of Abuja City and Lagos Third Mainland Bridge (Daniel, 2015).

Moreover, General Sani Abacha, according to scholars, fronted a debt buy-back involving ASCL in 1996, by withdrawing the sum of \$2.5 billion from the Central Bank of Nigeria (CBN) meant to settle the debt owed by Tiazhpromexport of Russia for building ASCL. He negotiated with the Russians for a debt buy-back in which he gave \$500 million to the builders of ASCL and took \$2 billion (Administrator, 2011; Agubamah, 2009; BBC NEWS, 1998; Daniel & Freeman, 2007; Obadina, 1999; Oyediran, 1998). These actions by the military affected the completion of ASCL.



*Location of ASCL:* ASCL was located at Ajaokuta after feasibility studies were carried out by the Russian steel experts (Agbu, 2007; Mohammed, 2002a). Interviewee AA5 posited that all the relevant natural resources for the siting of a steel industry are available in Kogi State.

However, Agbu (2007) argues that ASCL was located at Ajaokuta by political permutation of politicians. For this reason, interviewees AA1, AA2, AA3, AA5, AA7, AA8, AB1, AB2, AB3, AB6, AB7, AB9 and AB10 considered the location of ASCL as one of the reasons for its non-completion.

*Dissolution of Nigeria Steel Development Authority (NSDA):* NSDA was established in 1971 on the advice of the Russian steel experts that built ASCL (Federal Republic of Nigeria, 2008). However, NSDA was dissolved in 1979 and the Ministry of Mines and Steel Development became ASCL's supervisory Ministry (Mohammed, 2002a). After the transfer of ASCL to the ministry:

*a lot of activities were then haphazardly embarked upon; lots of inflated subsidiary projects were being simultaneously chased (Mohammed 2002a).*

*Ethnicity:* Table 3 (Se{i}) revealed that ethnicity affects socio-economic development. The overall mean is 1.57 and the group means equal ASCL = 1.50; ACAJO = 1.33; and CISOT = 1.79. This reveals that ethnicity affects socio-economic development. In Nigeria, even political parties are formed along ethnic/geo-political zones.

*Corruption:* Statement Se (ii) in Table 3 examined corruption as one of the characteristics of neopatrimonialism. The overall mean of 1.12 and the group means (group ASCL= 1.00; group ACAJO= 1.00; group CISOT= 1.32) reveals that there is corruption in Nigeria. KW p.value and MW p.values are significantly different. Groups ASCL and CISOT are significantly different. Groups ASCL and ACAJO have higher agreement than group CISOT to the presence of corruption in parastatals in Nigeria. Interviewee MB4 argued that corruption is the enemy that is withholding the completion of ASCL and said it is the greed of technocrats who are not patriotic. He further contended that corruption was exhibited while drafting the concessional agreement with Global Infrastructure Holdings Limited (GIHL) that made no provision for the input of the office of Attorney-General of the Federation (AGF). Interviewees AA1, AA2, AA6, and AB1 pointed out that the process of concessioning ASCL to GIHL is fraudulent and GIHL manifested that fraud through the cannibalisation and vandalization of plants and equipment, and lack of maintenance of equipment.

The Pohang Steel Company Limited (POSCO) of India which is the 10<sup>th</sup> largest steel company in the world today is said to be state owned, have similar design, and took off almost at the same period with ASCL but ASCL is yet to be completed (Okafor, 2007). This is linked to corruption. Dr Mohammed Sanusi who is the secretary-general of African Iron and Steel Association (AISA) remarked that the cost of the first phase of ASCL which was originally put at \$1.5 billion has now gulped about \$6 billion and

still yet to be completed. He remarked that a contract that is supposed to cost the government five million naira will be corruptly tripled to fifteen million naira in Nigeria (Kadiri, 2012).

*Patronage:* The examination of Table 3 (Se{iii}) revealed that patronage [5] affects socio-economic development of a country and it is one of the characteristics of neopatrimonialism. The overall mean is 1.96 meaning that, patronage affects a country's development.

*Ineffectiveness of Anti-corruption Agencies:* Table 3 (Sh) shows that there are enough structure in Nigeria to deal with frauds, corruption, money launderers and other economic and financial crimes offenders. In Nigeria, there are structures like Economic and Financial Crimes Commission (EFCC), Code of Conduct Bureau (CCB), and Independent Corrupt Practices and other related offences Commission (ICPC) to deal with corruptions and other fraudulent practices. ACAJO is of the opinion that anti-corruption agencies in Nigeria are capable of tracking down financial and economic crimes offenders. ASCL (2.94) and CISOT (2.05) are of the opinion that the performances of the above agencies are below expectation.

## 8. Discussion of Findings

This study investigated corruption in Nigeria with an in-depth examination of ASCL. Neopatrimonialism was used to guide the researcher into knowing what is happening in ASCL and this guided the particular application of the methods. Neopatrimonialism as noted earlier is when a leader converts what belongs to the people into his personal properties and takes the office he occupies as a personal inheritance and owes no accountability to anyone (Ikpe, 2000). The major findings of this study are highlighted and discussed below.

First, *lack of political will*. This means that the leader has no interest in completing a project embarked upon by his/her predecessors but may want to re-locate the same project to his/her own ethnic place of origin. This action takes place when the leader according to the interviewees has the intention of relocating the project to the area he hails from and to re-award the contract to friends, relations, classmates and political associates. Ethnicism and nepotism are characteristics of neopatrimonialism. This is consistent with other findings that people in government are loyal to their ethnic place of origin since Nigeria's independence in 1960 (Agbibo, 2012; Akinola, 1988; Salawu & Hassan, 2011). Lack of political will is traced to the politicians' self-interest in seeking what is the best for themselves, families, friends and ethnic groups (Balko, 2013; Urgo, 1995). Mohammed & Yusuf (2004) argue that Nigerian leaders' political will can only be stimulated if they place their love on their country above themselves, families, friends and ethnic groups.

Second, the staff of ASCL and other stakeholders interviewed were of the view that ASCL was not completed because it *was not located* in the region of one of the major

tribes in Nigeria. They argued that the locational issue was the key factor and not the feasibility of the site. Agbu (2007) argued that Ajaokuta is a feasible site. Agbu (2007) earlier agreed with Mohammed (2002a) that Ajaokuta was a feasible location for the steel as recommended by the Russian experts that undertook the feasibility study and that the needed raw materials were available in Ajaokuta (Agbu, 2007; Oyeyinka & Adelaye, 1988). Since independence in 1960, those in leadership positions are interested in siting public projects in the areas where they come from (Agbibo, 2012). *Ethnic preferencing* is one of the characteristics of neopatrimonialism. It is where a leader prefers to take a parastatal notwithstanding the suitability of the environment and the availability of the needed raw materials for the industry (Agbibo, 2012; Akinola, 1988; Iyoha, 2008; Salawu & Hassan, 2011).

Third, ASCL was labelled *out-dated technology* because the western countries advised Nigeria to concentrate on agriculture when Nigeria approached western experts in 1958 for the establishment of a steel company (Agbu, 2007; Mohammed, 2002a). However, interviewees argued that Global Infrastructure Holdings Limited (GIHL) turned out iron rods and wires from the completed rolling mill units during GIHL's period in ASCL. Majority of the interviewees and technology experts argued that technology cannot be wholly jettisoned but modified to meet the need of the moment. The reason for saying ASCL technology is an out-dated technology could be to flood African countries with their steel products and to possibly advocate for another steel company to be built for Nigeria instead of ASCL. When people impose their personal interest on people for their personal gain, it is neopatrimonialism. Other interviewees are of the views that the technology that Nigeria paid for was short-changed as it is supplied out-dated technology. This is done for personal gain. It is corruption which is in line with the argument of Sikka and Lehman (2015).

Fourth, *military interventions in Nigerian politics* have affected the completion of ASCL. Various amounts set aside for the completion of ASCL were either removed out-rightly or misappropriated by the military without accountability. This is prebendalism (a characteristic of neopatrimonialism) where a leader takes his political office as inheritance and use personal discretion in decision making (Ikpe, 2000). Military regimes give no room for criticisms and accountability (Brinkerhoff & Goldsmith, 2002).

Fifth, another factor considered by interviewees to be the reason why ASCL has not been completed is *corruption*. Interviewees argued that the concessional agreement between FGN and GIHL was done without the input of the Attorney-General of the Federation. This is considered to be fraudulent and with the intention to evade accountability. Where a decision is taken secretly without people's involvement, it is neopatrimonialism (Brinkerhoff and Goldsmith, 2002). This is in agreement with the previous studies which maintain that ASCL is in its present condition because of

inflated contracts and ministerial mishandling (Alli-balogun, 1988; Kadiri, 2012; Mohammed, 2002a).

Sixth, *the dissolution of Nigeria Steel Development Authority (NSDA)* was considered to be another reason why ASCL has not been completed. The action by politicians to make the Ministry of Mines and Steel Development the supervisory ministry of ASCL may on the face of it suggest that they intended to interfere in ASCL's activities and to neopatrimonialise ASCL. This will make the ministry to take over the decision making on ASCL thereby side-lining the steel professionals in NSDA. The NSDA was established on the advice of Soviet experts. In Singapore, a similar independent body, Temasek Holdings Limited (THL) was set up for parastatals, which controls and directs them, and gives account to Singapore people (Anwar and Sam, 2006).

Seventh, *the inconsistency in government policies* by neglecting projects initiated by the previous government, ASCL has been greatly affected. This is done in order to start a similar project elsewhere so as to have advantages of awarding a new contract with its kickbacks. It shows lack of respect for continuity (Okafor, 2007). This is neopatrimonialism where a leader awards contract to people who are his relations, friends and political associates (Balko, 2013; Urgoiji, 1995).

Eighth, *Ineffectiveness of anti-corruption agencies*. The Independent Corrupt Practices and other related offences Commission (ICPC) and the Economic and Financial Crimes Commission (EFCC) are the two major anti-corruption agencies in Nigeria. They have the functions of curbing bribery and corruption, fighting economic and financial crimes; investigating, preventing and prosecuting those that are corrupt (EFCC Act 2004; ICPC Act 2000; Sec.46; Iyoha & Oyerinde, 2010). These agencies have defects: in the sense that, they are weak in implementing the anti-corruption laws. The courts are weak and the agencies teach offenders how to escape the anti-corruption laws. Corruption offenders hire senior lawyers to evade justices in law courts. The executive arm of government interferes in the operation of the agencies by setting free their favourites. The agencies are poorly funded and they are under staffed. There is no protection for whistle blowers and no special court is available to try accused persons. These weaknesses are affecting EFCC and ICPC in performing their functions effectively. Respondents and interviewees suggested a special court for the EFCC as a remedy to some of these anomalies.

Government interference and impunity have made some offenders to go scot-free. This is in line with Goldsmith (2007) who states that government gives preferential treatments to some people and make them go without being punished. This action by the government makes the work of EFCC and ICPC difficult. Government interference in the work of EFCC and ICPC can be argued to be *patron-client* relationship.

Due to foregoing, especially given the perception of sabotage and mischief, African governments advised by the World Bank (Ariyo & Jerome, 1999) subsequently

followed a trend from the developed world by “hollowing out” [6] parastatals (Rhodes, 1997). It is also because of the lack of good governance and accountability in the public sector that has prompted the World Bank to encourage countries to privatize parastatals, introduce budgetary discipline, decentralise administration, encourage market competition and make greater use of non-governmental organisations to achieve efficiency in the public service (Rhodes, 1997).

Most developing countries are beginning to follow this step, especially as it is required by the World Bank and other lending agencies as a condition for loans and aids (Uddin & Hopper, 2003). Nigeria promulgated the Nigerian Privatisation and Commercialisation Decree No. 25 of 1988 and subscribed to the view that business should be left in the hands of professional people (Ahunwan, 2002).

### **9. Conclusion**

This paper analysed corruption in Nigeria using ASCL as a case study. The central question is: “why has ASCL experienced serious delays in steel production over the period since 1979 to date?” The following emerged as the reasons why ASCL has not been completed based on the documents consulted, interviews conducted and the questionnaires administered: (i) lack of political will; (ii) ASCL technology, is an out-dated technology; (iii) international and local politics; (iv) military interventions in politics; (v) corruption; (vi) location of ASCL; (vii) dissolution of NSDA; (viii) inconsistency in government policies. The theory of neopatrimonialism has been used as a search light to discover what ASCL is experiencing. Neopatrimonialism is based on the principles that people in authority convert public resources for personal use.

The industrialisation of a country depends on its access to iron and steel. From the foregoing, it is recommended that: Leaders should exercise political will and courage to complete ASCL. Leaders should be consistent in their policies and monitor their implementation. Government is a continuum and therefore a new government should continue with the projects initiated and embarked upon by the previous government. The military should face their constitutional duties. Political offices should be made less attractive to Nigerians; ASCL, if not privatised, should have a supervising agency other than the Ministry of Mines and Steel Development to avoid interference. Leaders should avoid sentiment and ethnicity. A special court should be established for the EFFC and ICPC to enable them prosecute economic crime offenders to hasten unbiased justice.

The decision to limit the study to ASCL without comparing it with a similar organisation is a limitation of this research. The circumstances surrounding ASCL necessitate a holistic and an in-depth study to unearth the reasons for stoppage of work for over two decades ago. Also the limitation of non-comparison with similar organisation is due to time factor, lack of resources, and difficulty in gaining access to parastatals. With the foregoing shortcomings of case study, to generalise the findings of this study may not be appropriate.

This study contributes to the literature on corruption in Nigeria. The theoretical framework of this study relates to developing countries. It is most suitable to the case under investigation.

Further research may look at two or more cases. The theory of neopatrimonialism could be used to compare ASCL with other parastatals or private steel companies in Nigeria. The researcher can also investigate in-depth into the international communities' connections with ASCL's case and international agencies suggestions concerning ASCL.

### Notes

1. A theory gives new insights and broadens one's understanding of a phenomenon (Anfara & Mertz, 2006).
2. Miraculous food – something obtained without effort (Collins Dictionary and Thesaurus, 2000).
3. In all the Nigerian military ruled for 29 years up to 1999 from 1966: Nnamdi Azikiwe (Governor-General) and Tafawa Balewa (Prime Minister) 1960-63; Tafawa Balewa (Prime Minister) and Nnamdi Azikiwe (Ceremonial President) 1963-1966; Gen. Aguiyi Ironsi (Military) Jan. 1966- July 1966; General Yakubu Jack Gowon (Military) 1966-1975; Gen. Murtala Muhammed (Military) 1975-1976; Gen. Olusegun Obasanjo (Military) 1976-1979; Alhaji Shehu Shagari (Civilian) 1979-1983; Gen. Muhammadu Buhari (Military) 1983-1985; Gen. Ibrahim Babangida (Military) 1985-1993; Earnest Shonekan (undemocratic civilian-no voting-installed by the military) August 1993-Nov. 1993; Gen Sani Abacha (Military) 1993-1998; Gen. Abdulsalami Abubakar (Military), 1998-1999; Chief Olusegun Obasanjo (Civilian) 1999-2007; Alhaji Musa Yar'Adua (Civilian) 2007-2010; Goodluck Ebele Jonathan (Civilian) 2010-2015; Muhammadu Buhari (Civilian) 2015-To date.
4. The taxpayers/public in this case are the civil servants, journalists, lawyers, academics, doctors, and others within sights into parastatals.
5. Patronage is also one of the characteristics of neopatrimonialism which means politically motivated distribution of favours to ethnic groups by a leader (Erdmann & Engel, 2007).
6. Introducing private sector management principles into the public sector or privatising parastatals (Rhodes, 1997).

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**Implications of Sources of Finance on the Growth of Small and Medium Scale Enterprises (SMEs) in Nigeria: An Evaluation of Selected Agricultural SMEs in Nigeria's Nassarawa State**

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**Abstract**

*The study observed that most SMEs in Nigeria have limited or no access to different sources of finance and also lack the basic knowledge to having the right blend of finance from different sources that can help achieve different growth objectives. Thus, it evaluated the implications of sources of finance on the growth of SMEs in Nassarawa State, Nigeria. The study used 131 observations obtained from SME owners or managers that were purposively selected from four different agro related SMEs including crop farming, fish farming, poultry farming and agro input traders. The multiple regression was employed and the study discovered that the different sources of SME's finance have significant and positive implications on the overall growth of SMEs in Nigeria, but that some sources have more implications on some particular growth indices than the others. Thus, it was recommended that SMEs' owners and managers must be diligent and strategic in the choice of source of finance in order to efficiently attain particular growth objectives. Furthermore, SMEs' owners and managers should improve their knowledge on financial structure in order to get the appropriate combination of finance from the different sources that can help attain growth objectives efficiently.*

**Keywords:** Finance, Growth, Internal, Source, Strategic

**JEL Classification:** Q14, R51

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**1. Introduction**

No organization including the not-for-profit and for-profit; particularly the small and medium scale enterprises (SMEs) was created to remain the way it is forever. It is created to continue growing and expanding, and possibly to become an empire. Thus, every organization requires the right combination of the five main inputs popularly referred to as the 5Ms for the smooth and successful management, operations and

attainment of the different growth objectives. These five inputs or variables of every organization include the Man, the Machines, the Method, the Materials and the Money.

The man refers to all the human factors of the organization, which is considered indispensable, complex and unpredictable. Machines entail the tools and equipment employed by the organization, method signifies the mode or system, materials stand for raw materials been used, and the money simply refer to the organization's finance. Each of these five organizational inputs or variables is almost as important as the other, but the money or finance is considered to be the life wire of the organization by experts, contributors and practitioners.

The small and medium scale enterprises (SMEs) require finance for their activities survival and growth like every other organization. This group of businesses that is prevalent in developing economies like Nigeria has different sources of finance at its disposal. Suffice to note that using the right combination of finance from the different sources would enable the SMEs efficiently achieve their different growth objectives. These growth objectives could be organic, strategic and internal.

Generally, the different small and medium scale enterprises (SMEs) in the different sectors, especially in the agricultural sector in Nigeria including crop farming, poultry farming, fish farming, and trading in agricultural inputs have different sources of finance including finance from personal savings popularly referred to as owner's equity; family and friends; grants; retained earnings (profit); leasing; factoring; cooperatives; bank facilities; etc. These different sources of finance are available to help the SME attain its internal and strategic growth objectives such as improving its operational efficiencies and attaining its new markets penetration strategy.

Suffice to state that despite the imperativeness of SMEs having access to different sources of finance in order to survive, grow and to expand, it has been observed that most SMEs, particularly those in the agricultural sector notably crop, poultry and fish farmers as well as dealers or traders in agricultural inputs (such as fertilizers, chemicals, animal feeds, tools, equipment, raw materials, etc.) have little or no access to most of these external sources of finance such as grants, leasing, bank facilities and even family/friends. Despite the efforts by the relevant policy makers, most agro based SMEs have difficulties achieving their strategic and internal growth objectives because of the limited or lack of access to such sources of finance.

Additionally, it has been observed that most agro based SMEs also lack the basic knowledge to determine the right or appropriate combinations of finances from these different sources that can help them efficiently achieve their strategic and internal growth objectives. Having the wrong or inappropriate combination of finance from different sources may have negative consequences for achieving SME growths.

Consequently, the study evaluated the implications of sources of finance on the growth of small and medium scale enterprises (SMEs) in Nigeria. Specifically, it examined the



extent of implications of the sources of finance on the strategic growth of the selected SMEs, and assessed the degree of implications of the sources of finance on the internal growth of the selected SMEs in Nassarawa State, Nigeria.

This study was conducted in Nassarawa State. This State shares border with Nigeria's Federal Capital Territory (FCT) where the seat of government is located. It is a State that hosts most agro based SMEs owned by residents of the Federal Capital Territory (FCT) that are considered enlightened, educated and conversant with the different government policies.

Based on the identified gaps from the review of literature the study purposively selected and evaluated the collective and individual implications of some common sources of finance including grants, leasing, bank facilities and family/friends on the strategic (penetrating new market) and internal (operational efficiency) growths objectives of some selected agro related SMEs in the State in the last six years (2015-2020). This was a period when the federal government's focus is on agriculture. Grants and bank facilities were adopted because these are the major sources of SMEs' finance that the federal government has developed several policies in the last six years, while finances through leasing and from family/friends are easily accessible sources available to SMEs in Nigeria.

Suffice to add that the four selected agro related SMEs (crop farming, fish farming, poultry farming and traders in agro inputs) are within the CAMA 2020 description of small businesses. The Act described small businesses as those whose directors are the major shareholders and have no foreign owner. Additionally, such businesses must have an annual turnover of not more than N120 million and net assets value of not more than N60 million. This group or class of SMEs is chosen because it is the most recent official description of SMEs in Nigeria.

## **2. Literature Review**

### *The Concept of Finance and its Source*

Several definitions of these concepts exist, but a few have been adopted for the study. Generally, the CFI (2018) defined finance as the management of money and other related activities such as investment, borrowing and/or lending, saving, budgeting, projecting and forecasting. Specifically, with reference to the business and SMEs, Bature and Ojobi (2019) conceptualized business finance as the management of available cash, bank balance, other assets, capital and credit liabilities at the disposal of or possessed by the business for efficiently carrying on its activities and achieving the different objectives. Weston (2017) defined it as the pooling and managing of business funds. Mandalika (2020) presented business finance simply as the employed funds and credit in a business.

The small and medium scale enterprises (SMEs) have two major sources of finance which include the internal and the external sources. The internal sources are the funds

and other assets generated from within its activities or operations while the external sources are those funds and assets from outside the business's activities and operations.

Consequent upon the review of empirical studies, some gaps were identified. Thus, four very common external sources of finance available to agro related SMEs including grants, leasing, bank facilities and family/friends were purposively adopted. The implications of these sources were each and collectively evaluated in relation to the strategic and internal growth objectives of the selected agro related SMEs.

The finance from the family and friends referred to the SMEs' funds and assets in form of contributions or loans from the owners' relatives while leasing implied to an agreement(s) between the asset owner and the SME(s) granting the latter access to the use of the involved asset(s) for its business activity for a period of time. Bank facilities referred to the different bank loans (with or without interest) and grant included the funds (money) and/or capital contributed to the SME(s) by persons, groups, other organizations and the governments to help it meet its financial obligations so as to continue growing and to also achieve their growth objectives.

#### *Concept of Small and Medium Scale Enterprises (SMEs) Growth*

The concept of small and medium scale enterprises (SMEs) has no universal nomenclature or definition. It is called by different names at different places. Similarly the definitions are relative with respect to times and places. In Nigeria, the definitions vary with time as well as with agencies and groups. For instance, the 2010 Company and Allied Matters Act (CAMA, 2010) defined a small business as any with an annual turnover of not more than N2 million or a net worth of not more than N1 million while the reversed CAMA 2020 defined it as a private business with the directors as major shareholders and without any foreign owner, but with an annual turnover of not more than N120 million and net assets value of not more than N60 million. This latter definition was adopted for the study and the class of the adopted SMEs

The concept of small and medium scale enterprises (SMEs) growth has also been described in so many different ways. An online platform, [thebusinessdictionary.com](http://thebusinessdictionary.com) described it simply as improving some components of a business's success while Dobbs and Hamilton (2007) defined it as the change in size of the organization during a specified period of time. Brush, Ceru, and Blackburn (2009) perceived SME or business growth as increasing the number of branches or locations or products, entering into new markets, attracting new customers, mergers and acquisitions.

Having conceptualized the major study's variables and the adopted indices, the study basically focused on evaluating the collective and individual implications of the adopted indices of sources of SMEs finance including grants, leasing, bank facilities and family/friends on each of the selected agro related SMEs' strategic (entering into new markets and establishing branches) and internal (operational efficiencies) growth objectives.

*Theoretical Framework*

This study was hinged on the Resource Based Theory popularly referred to as the Resource Based View (RBV). This theory has two major contributors including Edith Penrose and Jay Barney, but the latter is credited with the major and significant contributions. The theory is a managerial framework employed to enable businesses including SMEs to consistently gain competitive advantage and growth using its internal resources including assets (finance) and capabilities.

Penrose (1959) and Barney (1991a, 1991b), the proponents of the theory were of the opinion that businesses including SMEs possessed resources including finance that can enable them gain competitive advantage leading to long-term performance such as efficiently achieving the different organizational growth objectives the strategic and internal. Madhani (2009) observed that the theory scrutinized and explained resources in the organization's possession. These resources such as finance are believed to enable the business or SME achieve competitive advantage and overall objectives including growth.

*Empirical Review*

Oladele, Oloowokere and Akinruwa, (2016) in a similar study on sources of finance and SME's performance in Ado-Ekiti metropolis, using such indices as personal savings, formal and informal sources of finance on SMEs' performance, administered copies of questionnaire on 225 in 45 registered SMEs. Employing the regression statistical technique, the study discovered that each source of finance has reasonable connection with SME's performance and that the micro finance bank (MFB) is the formal source with the closest relationship. Thus, the study concluded that sources of finance have significant relationship with SME's performance and that the formal source has the most significant impact.

In another similar study by Owenvbiugie and Igbinedion (2015) on the role of finance on the growth of SMEs in Edo State, Nigeria with a sample size of 122 respondents, the study employed the mean and the standard deviation statistical techniques and it was discovered that lack of access to finance from financial institutions because of the stringent requirements is significantly hindering the growth of SMEs in the State. Thus, it was suggested that the various governments and other stakeholders should provide necessary financial assistance to accelerate SMEs' growth.

In another related study by Serrasqueiro, Leitão and Smallbone (2018) on SME growth and sources of finance before and after the financial crisis of 2008-2012 in Portugal, the study adopted indices such as interest rate, debt, firms' ages and sizes as well as cash flow and GDP, and it was discovered that cash flow was the least significant to SMEs' growth while debt had the strongest negative impact on the growths of SMEs. Terungwa (2011) evaluated SMEs' equity investment schemes (SMEEIS) in Nigeria's Benue and Nassarawa States focusing on total credit to SMEs from 1993 through 2008 using the t-test, mean scores and standard deviation. Finding revealed insignificant

variation between credits or loans disbursed pre and post introduction of SMEEIS by banks because of the stringent conditions in place. Thus, it was recommended that the governments and the banks review the conditions by making it less stringent and also incorporating a mutual risk-sharing arrangement in order to accelerate the growth of this sector of the economy.

Abbasi, Wang and Abbasi (2017) studied potential sources of financing SMEs and role of the government in order to increase the understanding of other available sources of finance and pointing out the demography of SMEs. Abdulsaleh and Worthington (2013) concentrated on studying SMEs financing for better understanding of the financial behaviour and practices of this category of business. Eniola and Entebanga (2015) presented a conference paper on “SME firm performance-financial innovation and challenges” in order to present sources of SME’s finance as well as challenges. The study suggested how SMEs can crowd fund as a major source of SME finance.

**3. Methodology**

This study focused on evaluating the extent and degree of implications of sources of finance on the growth of small and medium scale enterprises (SMEs) in Nigeria. Particularly it assessed and examined the extent and degree of the collective and separate implications of some selected sources of SMEs finance including grants, leasing, bank facilities, and family/friends on each of the strategic and internal growth of 164purposively selected agro based SMEs including cash crop farming, poultry farming, fish farming and dealers or traders in agricultural inputs in Nassarawa State, North Central Nigeria. This number was adopted because it was difficult to get a record showing the population of agro based SMEs in the State.

The study administered copies of the 5-point Likert scale questionnaire on these purposively selected agro based SMEs and analyzed the data using multiple regression estimation. The multiple regression estimation was employed because it has the capacity to disclose the extent or degree of implications of each adopted indices (grants, leasing, bank facilities, and family/friends) of the independent variable (sources of finance)using the response rates on each adopted indices (strategic or internal growths) of the dependent variable (SME’s growth) via the slope or beta (β) coefficients or values in the model. The calculated beta (β) coefficients or values in the model also indicate the appropriate combination of the different sources of finance that can efficiently achieve related growth objectives.

Furthermore, the multiple regression estimation also include the co-efficient of determinant (R<sup>2</sup>), which is another very significant and relevant value that explain the collective implications of the adopted indices of the independent variable on each dependent variable.

The regression model for the selected agro related SMEsis stated as follows:

$$S_{TR} = \alpha + \beta_1 (F_{FS}) + \beta_2 (L_{SG}) + \beta_3 (B_{NK}) + \beta_4 (G_{RT}) + \epsilon I \dots\dots\dots 1$$

$$I_{NT} = \alpha + \beta_1 (F_{FS}) + \beta_2 (L_{SG}) + \beta_3 (B_{NK}) + \beta_4 (G_{RT}) + \epsilon_1 \dots\dots\dots 2$$

Where  $S_{TR}$  represents the selected agro related SMEs' strategic growth objectives in Nigeria;  $I_{NT}$  represents the selected agro related SMEs' internal growth objectives in Nigeria;  $\beta_1$ ,  $\beta_2$ ,  $\beta_3$  and  $\beta_4$  are the beta values of the respective adopted indices of the independent variable (sources of finance) including from family/friends ( $F_{FS}$ ), leasing ( $L_{SG}$ ), bank facilities ( $B_{NK}$ ) and grants ( $G_{RT}$ ). Note that these computed beta values ( $\beta_n$ ) often referred to coefficients explained the extent or degree of implications of each adopted indices of the independent variable on each adopted indices (strategic or internal growths) of the dependent variable (SME's growth); and  $\epsilon_1$  is the stochastic error (error of significance of 5%) term.

#### 4. Result

Table 1: Response Rate and Other Significant Characteristics of Respondents

Characteristics	Respondents	Frequency	Percentage
SMEs Response Rates	Crop Farming	31	23.66%
	Poultry Farming	33	25.19%
	Fish Farming	35	26.72%
	Agro Input Traders	32	24.43%
Academic Qualifications	SSCE/WAEC	28	21.37%
	NCE/OND & Equivalents	14	10.69%
	HND/BSc & Equivalents	66	50.38%
	Postgraduate	23	17.56%
Relevant Experience	Below 5 years	45	34.35%
	5-10 years	59	45.04%
	Above 10 years	27	20.61%
Total		131	100%

Source: Field Survey, (2020)

Table 1 disclosed the response rates and other relevant features of the study's respondents from across the four different agro related SMEs including cash crop farming, poultry farming, fish farming and dealers/traders in agro inputs in Nassarawa State, North Central Nigeria. Significantly, the table displayed that about 79% of these 131 respondents were holders of post secondary school certificates including Ordinary National Diploma (OND) and its equivalents; first degree school certificates including BSc., BEd., BPharm., BA., etc. or its equivalent and postgraduate certificates or degrees including PGD., MPA., MBA., MSc., MEd., MA., PhD. etc. Furthermore, it showed that about 45 of the respondents representing 34.35% had less than 5 years related investment experience while 59 (45.04%) had between 5-10 years related

experience and 27 or 20.61% had above 10 years related experience. These characteristics were considered very significant and relevant to the quality of responses gathered for this study.

#### *Estimation Result*

In order to examine the extent of implications of the sources of finance on the strategic growth of the selected SMEs.

Table 2: Model Summary

R	R-Squared	Adjusted R Squared	Std. Error of the Estimate
0.800	0.639	0.631	0.850

Note: Predictors: (Constant)FFS, LSG, BNK, GRT

Source: Authors Computation

Table 2 displayed the model summary in relation to the specific objective one. The table, through the R-Squared ( $R^2$ ) value revealed the extent of implications of all the adopted indices of the independent variable (sources of finance) on this particular dependent variable (SME's strategic growth). The  $R^2$  value of 0.639 (63.9%) revealed the extent of implications of all adopted sources of finance (including grants, leasing, bank facilities and finance from family members or friends) on variations with respect to the strategic growth of the selected SMEs. It simply indicated that these adopted indices of sources of finance are collectively responsible for 63.9% variations in the strategic growth of the selected agro related SMEs including cash crop farming, fish farming, poultry farming and dealers/traders in agricultural inputs while the outstanding 36.1% are by other variables or factors not captured in this study.

Table 3 Analysis of Variance (ANOVA)

	Sum of Squares	df	Mean Square	F	Sig.
Regression	203.658	4	50.915	97.352	0.000 <sup>b</sup>
Residual	87.319	167	0.523		
Total	290.977	171			

Note: a. Dependent variable: SMEs' Strategic Growth; b. Predictors: (Constant)FFS, LSG, BNK, GRT

Source: Authors Computation

Table 3 displayed the Analysis of Variance (ANOVA) values. It showed that the adopted indices of the independent variable (sources of finance) are statistically significant at  $F(4, 167) = 97.352$ ,  $P < 0.05$ . Consequently, it signified that, the adopted sources of finance have significant and positive implications on the strategic growth of the selected SMEs in Nigeria.

Table 4 displayed the appropriate combination of the adopted sources of finance as well as the computed coefficient values ( $\beta_x$ ) of each adopted index in relation to the adopted index of the dependent variable (SME's strategic growth) using the multiple regression estimation. The function indicates the right or appropriate blend or

combinations of the different adopted sources of finance that can efficiently achieve the selected SMEs' strategic growth objectives.

Table 4 Regression Coefficients

	B	Std. Error	Beta	T	Sig
(Constant)	1.314	0.256		1.228	0.221
FFS	0.381	0.079	0.341	4.800	0.000
LSG	0.349	0.068	0.331	5.151	0.000
BNK	0.200	0.069	0.172	2.896	0.004
GRT	0.125	0.071	0.107	1.760	0.080

Note: a. Dependent Variable: SME's Strategic Growth

Furthermore, the result disclosed the extent of implication of each of the adopted indices of sources of finance including finance from family members and friends ( $F_{FS}$ ); leasing ( $L_{SG}$ ); bank facilities ( $B_{NK}$ ) and grants ( $G_{RT}$ ) on the strategic growth ( $S_{TR}$ ) of the selected agro related SMEs. It showed that for every 1% change in the strategic growth ( $S_{TR}$ ) of the selected agro related SMEs there were 34.1% change in finance generated through family members and friends ( $F_{FS}$ ); 33.1% change in finance generated through leasing ( $L_{SG}$ ); 17.2% change in finance generated through bank facilities or loans ( $B_{NK}$ ); and 10.7% change in finance generated through grants ( $G_{RT}$ ).

Worthy of note is that these values ( $\beta_x$ ) revealed the adopted indices of the independent variable with the most and least implications. The values indicated that with the least variation of 10.7% in finance generated through grants ( $G_{RT}$ ) that source has the most implication on the strategic growth ( $S_{TR}$ ) of the selected agro related SMEs while finance generated through family members and friends ( $F_{FS}$ ) with a variation or change rate of 34.1% has the least implication on the strategic growth ( $S_{TR}$ ) of the selected agro related SMEs.

The study assessed the degree of implications of the sources of finance on the internal growth of the selected SMEs in Nassarawa State, Nigeria.

Table 5: Model Summary

R	R-Squared	Adjusted R Squared	Std. Error of the Estimate
0.863	0.744	0.738	0.668

Note: a. Predictors: (Constant) FFS, LSG, BNK, GRT

Source: Authors Computation

Table 5 displayed the model summary in relation to the specific objective two. The table, through the R-Squared ( $R^2$ ) value revealed the extent of implications of all the adopted indices of the independent variable (sources of finance) on this particular dependent variable (SME's strategic growth). The  $R^2$  value of 0.744 (74.4%) revealed the extent of implications of all the adopted sources of finance (including grants, leasing, bank facilities and finance from family members or friends) on the variations with respect to the internal growth of the selected SMES. It simply indicated that these

adopted indices of sources of finance are collectively responsible for 74.4% variations in the internal growth of the selected agro related SMEs including cash crop farming, fish farming, poultry farming and dealers/traders in agricultural inputs while the outstanding 25.6% are by other variables or factors not captured in this study.

Table 6: Analysis of Variance (ANOVA)

	Sum of Squares	df	Mean Square	F	Sig.
Regression	216.524	4	54.131	121.418	0.000 <sup>b</sup>
Residual	74.453	167	0.446		
Total	290.977	171			

Note: a. Dependent variable: SME's Internal Growth; b. Predictors: (Constant)FFS, LSG, BNK, GRT

Source: Authors Computation

Table 6 displayed the Analysis of Variance (ANOVA) values. It showed that the adopted indices of the independent variable (sources of finance) are statistically significant at  $F(4, 167) = 121.418$ ,  $P < 0.05$ . Consequently, it signified that the adopted sources of finance have significant and positive implications on the internal growths of the selected SMEs in Nigeria.

Table 7: Regression Coefficients

	B	Std. Error	Beta	T	Sig.
(Constant)	.601	.201		2.986	.003
FFS	.195	.062	.187	3.122	.002
LSG	.779	.053	.792	1.623	.000
BNK	.074	.054	.068	1.359	.176
GRT	.068	.056	.063	1.230	.021

Note: a. Dependent variable: SME's Internal Growth

Table 7 displayed the appropriate combination of the adopted sources of finance as well as the computed coefficient values ( $\beta_x$ ) of each adopted index in relation to the adopted index of the dependent variable (SME's internal growth) using the multiple regression estimation. The result indicated the right or appropriate blend or combinations of the different sources of finance that can efficiently achieve the selected SMEs' internal growth objectives.

Furthermore, the result disclosed the degree of implication of each of the adopted indices of sources of finance including finance from family members and friends ( $F_{FS}$ ); leasing ( $L_{SG}$ ); bank facilities ( $B_{NK}$ ) and grants ( $G_{RT}$ ) on the internal growth ( $I_{NT}$ ) of the selected agro related SMEs.

The table and the function showed that for every 1% change in the internal growth ( $I_{NT}$ ) of the selected agro related SMEs there were 18.7% change in finance generated through family members and friends ( $F_{FS}$ ); 79.2% change in finance generated through



leasing ( $L_{SG}$ ); 6.8% change in finance generated through bank facilities or loans ( $B_{NK}$ ); and 6.3% change in finance generated through grants ( $G_{RT}$ ).

Furthermore, these values ( $\beta_x$ ) revealed the adopted indices of the independent variable with the most and least implications. The values indicate that with the least variation of 6.3% in finance generated through grants ( $G_{RT}$ ) that source has the most implication on the internal growth ( $I_{NT}$ ) of the selected agro related SMEs while finance generated through leasing ( $L_{SG}$ ) with a variation or change rate of 79.2% has the least implication on the internal growth ( $I_{NT}$ ) of the selected agro related SMEs.

#### *Major Findings*

Consequent upon the evaluation of the responses, the study discover that sources of SME's finance had significant and positive implication on the overall growth of small and medium scale enterprises (SMEs). Specifically and based on the examined data, it was discovered that sources of finance had significant and positive implications on the strategic growths of the selected SMEs in Nigeria. Furthermore, it was also found that, the adopted sources of finance also have significant and positive implications on the internal growths of the selected SMEs in Nigeria, but the extent or degree of these implications as well as the appropriate combinations of the sources of finance differ with respect to the growth objectives.

It is important to reveal that the computed results showed that SMEs' finances generated through grants from individuals, groups, agencies or governments had the most implications on the strategic and internal growths of these selected agro based SMEs, while SMEs' finances generated or gathered from family members and friends had the least implications on the strategic growths of these selected SMEs and those gathered through leasing had the least implication on the internal growths of these selected SMEs in Nigeria.

The overall finding that sources of SME's finance had significant and positive implications on the growth small and medium scale enterprises (SMEs) is consistent with findings by Oladele, *et al* (2016) and Owenbiugie *et al* (2015).

#### **5. Conclusions and Recommendation**

Based on the findings that sources of SME's finance had significant and positive implication on the overall growth of small and medium scale enterprises (SMEs) in Nigeria, but that some sources had more implications on some particular growth indices than the others, owners and managers of SMEs must be diligent and strategic in the choice of source and type of finance they access in order to efficiently attain particular growth objectives. It may be unproductive to access every available source of finance because there are implications. Owners and managers can go extra mile to improve their knowledge on financial structure in order to get the appropriate combination of finance from the different sources that can help attain growth objectives efficiently.

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## **Impact of Celebrity Endorsement and its Effect on the Loyalty of Undergraduates Students to Airtel Network**

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### **Abstract**

*This study examined the impact of celebrity endorsement on brand loyalty among Airtel subscribers in Ibrahim Babangida University Lapai. The study used survey as its methodology and adopted a multi-stage sampling as its techniques. The target population comprised 12,910 students of Ibrahim Badamasi Babangida University Lapai using a sample size of 341. The sample size was determined using Yamane model after purposively selecting three [3] cluster (faculties) at random from a group of six clusters. Data were collected using a self-administered structured questionnaire. The instrument had a Cronbach alpha of 0.78 adopted from the work of Mekonen (2017). The data collected were analyzed using descriptive statistics and inferential statistics. The findings revealed that celebrity endorsement had significant influence on brand loyalty of Airtel customers in IBBUL Niger State, Nigeria. Based on this, it is recommended that Airtel telecommunication should adopt a general view rather than individual approach to celebrity endorsement programme.*

**Keywords:** Celebrity, Trustworthiness, Attractiveness, Expertise, Brand Loyalty

**JEL Classification:** L21

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### **1. Introduction**

In the Nigerian Mobile Telecommunication industry, advertising is dominantly led by celebrity endorsement. Although celebrity endorsement is not a recent thing (Hovland & Weiss, 1951), business people and advertising practitioners in particular are not withstanding evolving searches determining the extent to which the efficacy of celebrity endorsement as an independent variable construct influences various corporate performance indicators. For example, Ismael (2018) studied impact of celebrity endorsement on brand knowledge, Hani, Marwan and Andre (2018); effect of celebrity endorsement on consumer behaviour, Pokharel and Pradham (2017); influence of celebrity endorsement on consumers' buying behaviour, Mekonen (2017); impact of celebrity endorsement in creating awareness and motivating consumers. From the

foregoing, it can be deduced that studies on the impact of celebrity endorsement on brand loyalty are still scanty especially among university undergraduates..

Continuous patronage, which is a proxy of brand loyalty, is a means to an end which every business wish to attain. But, of the celebrity's attributes, which best determines customers loyalty? The Nigerian telecommunication industry has not been quite stable based on the country's desire to rapidly develop its telecommunication network to the level of international best practice. The competitive nature of the telecommunication industry has spring into tight-drawn competition for consumer attention and retention. Individual consumers are faced with the decision of choices as a result of product diversity springing up from competition.

The effectiveness of celebrities under any endorsement arrangement would depend on the characteristics of the celebrity such as trustworthiness, likeness, attractiveness, and expertise (Zipporah and Mberia, 2014). Marketers spend quite large sums on celebrity endorsement contract with the believe that celebrities are effective spokespersons for their products or brands. Firms spend a lot on advertisement, sales promotion and one-on-one selling with the mindset of getting consumers' loyalty. Advertisement is also one of the most used tools by marketers to create a good image and make their brand look superior to others in order to get the customers' loyalty.

However, many consumers see advertisement from unpopular spokespersons as a tool used by the firms to deceive consumers in achieving their sale. This is because of the lack of trust in an unfamiliar spokesperson, making the achievement of advertising a complete failure due to the views held by consumers. Firms have now realized that it is not just about the message being passed but also about the spokesperson passing the message. Agrawal and Kamakura (1995) believe that celebrities makes the advertisements believable and enhance the message in the minds of the consumers. Celebrities who have basically built trust in their public life now serve as role model for many consumers.

Also, celebrity endorsement may not guarantee long-term and sustainable effects where an endorsed celebrity is caught up in scandal or an act of criminality, thereby creating negative perception to consumers (zafar & Rafique, 2011). Some of the scandals may be involvement in the act of child, drug, sexual abuses, alcoholism, and racial discrimination (Sliburyte, 2009). Arora and sahu (2014) provided that consumer's intention may be affected due to changes in the celerity's image. Changes in image may be as a result of injury, marital status, physical appearance, or decline in professional capabilities. It could result in the celebrity no longer suitable for endorsement. It is based on these diverse opinions that this study examine how celebrities endorsement in advertising have influence on consumer loyalty of the Airtel customers in Lapai local government area of Niger State. Also, to determine the impact of celebrity expertise and attractiveness on consumers loyalty

## 2. Methodolgy

Multi-stage sampling technique was used to arrive at the sample size of the study. Simple random technique was used to randomly select three (3) faculties, Secondly, same technique was used to devide departments in each faculty to two (2). The selected departments has 325 and 353, 461 and 15, and 481 and 699 respectively. Hence, total sample population at this stage stood at two thousand three hundred and thirty four (2,334). Applying Yamane (1967), the sample size at stage two stood at 341. The study employs descriptive statistics involving percentage frequency counts and cross-tabulation in analyzing and interpreting some of the data. Multiple regression model show the effect of individual independent variable on the dependent variable. The probability (P) value of each independent variables coefficient in the model. If the coefficient sig is less than 5% level of significance, the null hypothesis will be rejected, otherwise accept.

$$\gamma = \alpha + \beta_1\chi_1 + \beta_2\chi_2 + \beta_3\chi_3 + \mu \dots\dots\dots 1$$

Where Y is the value of the Dependent Variable (brand loyalty),  $\alpha$  is the Constant or Intercept,  $\beta_s$  signifies the Slope (Beta Coefficient),  $\chi_1$  refers to celebrity attractiveness,  $\chi_2$  indicates celebrity trustworthiness,  $\chi_3$  stands for celebrity expertise and  $\mu$  is the unobserved term. The model can be properly written as

$$BL = CA_i + CT_i + CE_i + \mu_i \dots\dots\dots 2$$

Where BL is the Brand Loyalty CA stands for Celebrity Attractiveness, CT indicates Celebrity Trustworthiness and CE refers to Celebrity Expertise

## 3. Result

### *Descriptive Results*

Table 1 shows the descriptive statistics of the respondents to whom questionnaires were administered. From the data obtained, gender results shows 157 to be Males constituting 50.6% of the respondents and 153 Females which constitute 49.4%. This means that the highest respondents were male.

The ages of the respondent indicates 120 respondents fall below 21 years of age which constitutes 38.7% of the respondents. 156 of the respondents fall between the ages of 21-40 years which constitute 50.3% of the respondents. 31 of the respondents fall between 41-60 years which constitute 10% of the respondents. 3 of the respondents were above 60years which constitute 1% of the respondents. Therefore, the highest age respondents were 21-40 years.

The marital status also play important demographic variable, 176 of the respondents are single constituting 56.8% of the respondents, 110 of them are married constituting 35.5% of the respondents and 24 of them are divorced constituting 7.7% of the respondents. Therefore, the highest respondents were singles.

Table 1: Descriptive Statistics of the Respondents

Variable	Frequency	Percentage
Gender		
Male	157	50.6
Female	153	49.4
Age		
Less than 21 years	120	38.7
21-40 years	156	50.3
41-60 years	31	10
60 years & Above	3	1
Marital Status		
Single	176	56.8
Married	110	35.5
Divorced	24	7.7
Use of Airtel Network		
Yes	310	100
No	0	0
Celebrity Awareness		
Phyno	101	32.6
Tuface	126	40.6
Partoranking	83	26.8
Total	310	100

Source: Field Survey, 2020

Table 1 shows the descriptive statistics of the respondents to whom questionnaires were administered. From the data obtained, gender results shows 157 to be Males constituting 50.6% of the respondents and 153 Females which constitute 49.4%. This means that the highest respondents were male.

The ages of the respondent indicates 120 respondents fall below 21 years of age which constitutes 38.7% of the respondents. 156 of the respondents fall between the ages of 21-40 years which constitute 50.3% of the respondents. 31 of the respondents fall between 41-60 years which constitute 10% of the respondents. 3 of the respondents were above 60years which constitute 1% of the respondents. Therefore, the highest age respondents were 21-40 years.

The marital status also play important demographic variable, 176 of the respondents are single constituting 56.8% of the respondents, 110 of them are married constituting 35.5% of the respondents and 24 of them are divorced constituting 7.7% of the respondents. Therefore, the highest respondents were singles. In Table 1, it also shows that all respondents are Airtel subscribers which constitute 100%. Similarly, it shows that 101 of the respondents are aware of Phyno constituting 32.6%, 126 of the

respondents are aware of Tuface constituting 40.6%, and 83 of the respondents are aware of Partoranking constituting 26.8%. Therefore, most of the respondents are aware of Tuface.

Table 2: Respondents Celebrity Endorsement on the Loyalty of Airtel

	STD	SLD	D	U	A	SLA	STA	Total
My choice of Airtel is because of endorsement by a celebrity	17 (5.5%)	7 (2.3)	20 (6.5%)	26 (8.4%)	64 (20.6%)	73 (23.5%)	103 (33.2)	310 (100%)
I bought Airtel because of the attractiveness of the celebrity that endorsed it	20 (6.5%)	15 (4.8%)	15 (4.8%)	27 (8.7%)	46 (14.8%)	98 (31.6%)	89 (28.7%)	310 (100%)
I remember Airtel that is endorsed by an attractive celebrity	17 (5.5%)	14 (4.5%)	24 (7.7%)	39 (12.6%)	82 (26.5%)	86 (27.7%)	48 (15.5%)	310 (100%)
The presence of a celebrity enables me recognize Airtel	19 (6.1%)	17 (5.3%)	26 (8.4%)	38 (12.3%)	68 (21.9%)	99 (31.9%)	43 (13.9%)	310 (100%)
The handsomeness of the celebrity is what attracted me to buy Airtel	21 (6.8%)	19 (6.1%)	32 (10.3%)	40 (12.9%)	60 (19.4%)	69 (22.3%)	69 (22.3%)	310 (100%)
I find products endorsed by celebrity are trustworthy	12 (3.9%)	14 (4.5%)	18 (5.8%)	30 (9.7%)	73 (23.5%)	78 (25.2%)	85 (27.4%)	310 (100%)
The claims made by Airtel celebrity are believable	16 (5.2%)	9 (2.9%)	26 (8.4%)	44 (14.2%)	77 (24.8%)	87 (28.1%)	51 (16.5%)	310 (100%)
The honesty of a celebrity endorser makes me buy Airtel	13 (4.2%)	23 (7.4%)	22 (7.1%)	37 (11.9%)	95 (30.6%)	71 (22.9%)	49 (15.8%)	310 (100%)



	STD	SLD	D	U	A	SLA	STA	Total
I trust Airtel because it has been endorsed by celebrities	28 (9.0%)	16 (5.2%)	31 (10.0%)	31 (10.0%)	69 (22.3%)	65 (21.0%)	70 (22.6%)	310 (100%)
I bought Airtel because the celebrity endorsing it is an expert	16 (5.2%)	10 (3.2%)	26 (8.4%)	27 (8.7%)	58 (18.7%)	72 (23.2%)	101 (32.6%)	310 (100%)
Adverts having celebrities are more effective than those which don't	17 (3.5%)	17 (3.5%)	19 (6.1%)	45 (14.5%)	67 (21.6%)	79 (25.5%)	66 (21.3%)	310 (100%)
The skillfulness of the celebrity endorsers increase my awareness about Airtel	11 (3.5%)	20 (6.5%)	21 (6.8%)	27 (8.7%)	78 (23.2%)	84 (27.1%)	69 (22.2%)	310 (100%)
The experience of the celebrity triggers my willingness to buy Airtel	17 (3.5%)	27 (8.7%)	34 (11.0%)	41 (13.2%)	72 (23.2%)	44 (14.2%)	75 (24.2%)	310 (100%)
Airtel is my best network	11 (3.3%)	15 (4.8%)	28 (9.0%)	27 (8.7%)	62 (20.0%)	65 (21.0%)	102 (32.9%)	310 (100%)
I cannot switch from Airtel to any other network	14 (4.5%)	11 (3.35%)	28 (9.0%)	46 (14.8%)	74 (23.9%)	79 (25.5%)	58 (18.7%)	310 (100%)
I Won't switch from Airtel to a new network that is endorsed by my favorite celebrity	14 (4.5%)	17 (3.5%)	27 (8.7%)	41 (13.2%)	74 (23.9%)	80 (23.8%)	57 (18.4%)	310 (100%)
I won't stop using Airtel if my favorite celebrity	18 (5.8%)	26 (8.4%)	30 (9.7%)	33 (10.6%)	74 (23.9%)	74 (23.9%)	55 (17.7%)	310 (100%)

	STD	SLD	D	U	A	SLA	STA	Total
endorsing it got involved in a scandal Celebrity endorsement influences brand loyalty	24 (7.7%)	25 (8.1%)	23 (7.4%)	32 (10.3%)	68 (21.9%)	67 (21.6%)	71 (22.9%)	310 (100%)

Note: *STD= Strongly Disagree, SLD= Slightly Disagree, D = Disagree, U= Undecided, A= Agree, SLA= Slightly Agree, STA= Strongly Agree*  
 Source: Field Survey (2020)

Table 2 shows the response on celebrity endorsement on the customers loyalty of Airtel network. The choice of Airtel due to endorsement by a celebrity had 5.5% of the respondents strongly disagree, 2.3% slightly disagree with the question, 6.5% disagree, 8.4% were undecided, 20.6% agreed, 23.5% slightly agree, 33.2% strongly agreed. Therefore, most of the respondents strongly agree on I am attracted to buy Airtel endorsed by a celebrity. Buying Airtel because of the attractiveness of the celebrity that endorsed it shows 6.5% of the respondents strongly disagree, 4.8% slightly disagree with the question, 4.8% disagree, 8.7% were undecided, 14.8% agreed, 31.6% slightly agreed, 28.7% strongly agreed. Therefore, most of the respondents slightly agree on I bought Airtel because of the attractiveness of the celebrity.

The response to Airtel that is endorsed by an attractive celebrity have 5.5% of the respondents to strongly disagree, 4.5% slightly disagree with the question, 7.7% disagree, 12.6% were undecided, 26.6% agreed, 27.7% slightly disagree, and 15.5% strongly agreed. Therefore, most of the respondents slightly agree on I remember Airtel that is endorsed by an attractive celebrity.

For presence of celebrity 6.1% of the respondents strongly disagree, 5.5% slightly disagree with the question, 8.4% disagree, 12.3% were undecided, 21.9% agreed, 31.9% slightly agreed, and 13.9% strongly agreed. Therefore, most of the respondents slightly agree on the presence of a celebrity enables me recognize Airtel. Given the handsomeness stature of celebrity, 6.8% of the respondents strongly disagree, 6.1% slightly disagree with the question, 10.3% disagree, 12.9% were undecided, 19.4% agreed, 22.3% slightly agreed, and 23.3% strongly agreed. Therefore, most of the respondents slightly agree and strongly agree on the handsomeness of the celebrity is what attracted me to buy Airtel'. Most of the respondents strongly agree on I find products endorsed by celebrity as trustworthy, as 3.9% of the respondents strongly disagree, 4.5% slightly disagree with the question, 5.8% disagree, 9.7% were undecided, 23.5% agreed, 25.2% slightly agreed, and 27.4% strongly agreed. On claims made by Airtel celebrity, 5.2% of the respondents strongly disagree, 2.9% slightly disagree with the question, 8.4% disagree, 14.2% were undecided, 24.8% agreed,

28.1% slightly agreed, and 16.5% strongly agreed. Therefore, most of the respondents slightly agree on the claims made by Airtel celebrity are believable.

Looking at the honesty of a celebrity, 4.2% of the respondents strongly disagree, 7.4% slightly disagree with the question, 7.1% disagree, 11.9% were undecided, 30.9% agreed, 22.9% slightly agreed, and 15.8% strongly agreed. Therefore, most of the respondents agree on the honesty of a celebrity endorser makes me buy Airtel. For trust on Airtel because it has been endorsed by celebrities 9.0% of the respondents strongly disagree, 5.2% slightly disagree with the question, 10.0% disagree, 10.0% were undecided, 22.3% agreed, 21.0% slightly agreed, and 22.6% strongly agreed. Therefore, most of the respondents strongly agree on I trust Airtel because it has been endorsed by celebrities. Looking at the expertise of celebrity endorsement, 5.2% of the respondents strongly disagree, 3.2% slightly disagree with the question, 8.4% disagree, 8.7% were undecided, 18.7% agreed, 23.2% slightly agreed, and 32.6% strongly agreed. Therefore, most of the respondents strongly agree on I bought Airtel because the celebrity endorsing it is an expert. 5.5% of the respondents strongly disagree, 5.5% slightly disagree with the question, 6.1% disagree, 14.5% were undecided, 21.6% agreed, 25.5% slightly agreed, and 21.3% strongly agreed. Therefore, most of the respondents slightly agree on Ads having celebrities are more effective than those which don't.

Also in Table 2, the result for skillfulness of the celebrity endorsers increases awareness about Airtel shows 3.5% the respondents strongly disagree, 6.5% slightly disagree with the question, 6.8% disagree, 8.7% were undecided, 25.2% agreed, 27.1% slightly agreed, and 21.9% strongly agreed. Therefore, most of the respondents slightly agree on the skillfulness of the celebrity endorsers increases my awareness about Airtel. The experience of the celebrity triggering one willingness to buy Airtel shows that 5.5% of the respondents strongly disagree, 8.7% slightly disagree with the question, 11.0% disagree, 13.2% were undecided, 23.2% agreed, 14.2% slightly agreed, and 24.2% strongly agreed. Therefore, most of the respondents strongly agree on the experience of the celebrity triggers my willingness to buy Airtel. In choosing Airtel as best network, 3.5% of the respondents strongly disagree, 4.8% slightly disagree with the question, 9.0% disagree, 8.7% were undecided, 20.0% agreed, 21.0% slightly agreed, and 32.6% strongly agreed. Therefore, most of the respondents strongly agree on Airtel is my best network'.

For those that cannot switch from Airtel to any other network, the result shows 4.5% of the respondents strongly disagree, 3.5% slightly disagree with the question, 9.0% disagree, 14.8% were undecided, 23.9% agreed, 25.5% slightly agreed, and 18.7% strongly agreed. Therefore, most of the respondents slightly agree on I cannot switch from Airtel to any other network. The result for those not switching shows 4.5% of the respondents strongly disagree, 5.5% slightly disagree with the question, 8.7% disagree, 13.2% were undecided, 23.9% agreed, 25.8% slightly agreed, and 18.4% strongly

agreed. Therefore, most of the respondents slightly agree on I won't switch from Airtel to a new network that is endorsed by my favorite celebrity.

I won't stop using Airtel if my favorite celebrity endorsing it got involved in a scandal, in response 5.8% of the respondents strongly disagree, 8.4% slightly disagrees with the question, 9.7% disagree, 10.6% were undecided, 23.9% agreed, 23.9% slightly agreed, and 17.7% strongly agreed. Therefore, most of the respondents agree and slightly agree on I won't stop using Airtel if my favorite celebrity endorsing it got involved in a scandal. On celebrity endorsement influences brand loyalty, the result shows 7.7% of the respondents strongly disagree, 8.1% slightly disagree with the question, 7.4% disagree, 10.3% were undecided, 21.9% agreed, 21.6% slightly agreed, and 22.9% strongly agreed. Therefore, most of the respondents strongly agree on celebrity endorsement influences brand loyalty.

Table 3: Correlations

		Celebrity Attractiveness	Celebrity Trustworthiness	Celebrity Expertise	Brand Loyalty
Celebrity Attractiveness	Pearson Correlation	1	.455**	.322**	.267**
	Sig. (2-tailed)		.000	.000	.000
	N	310	310	310	310
Celebrity Trustworthiness	Pearson Correlation	.455**	1	.411**	.316**
	Sig. (2-tailed)	.000		.000	.000
	N	310	310	310	310
Celebrity Expertise	Pearson Correlation	.322**	.411**	1	.249**
	Sig. (2-tailed)	.000	.000		.000
	N	310	310	310	310
Brand Loyalty	Pearson Correlation	.267**	.316**	.249**	1
	Sig. (2-tailed)	.000	.000	.000	
	N	310	310	310	310

Note\*\*: Correlation is significant at the 0.01 level (2-tailed).

Source: Authors' Computation

The result of table 3 above shows that there is significant positive correlation between brand loyalty and celebrity endorsement variables (attractiveness, trustworthiness, and expertise).

Based on these findings, we reject the null hypothesis and accept the alternative hypothesis that, there is significant relationship between celebrity endorsement and brand loyalty on Airtel subscribers in Niger State.

Table 4: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.362 <sup>a</sup>	0.131	0.122	1.24926

Note: Predictors: (Constant), Celebrity Expertise, Celebrity Attractiveness, Celebrity Trustworthiness

Source: Authors' Computation

Table 4 above shows that the coefficient of determination is 0.362; the implication of this is that about 36.2% of the variation of brand loyalty is explained by variables in the model, which are, celebrity trustworthiness, attractiveness and expertise, whereas the remaining 63.8% is explained by other factors which are not included in the model. The regression equation (model formulated) appears to be very useful for making predictions since the value of R is close to 1.

Table 5: ANOVA<sup>a</sup>

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	71.870	3	23.957	15.350	0.000 <sup>b</sup>
Residual	477.560	306	1.561		
Total	549.430	309			

Note: a. Dependent Variable: Brand Loyalty; b. Predictors: (Constant), Celebrity Expertise, Celebrity Attractiveness, Celebrity Trustworthiness

Source: Authors' Computation

In Table 5, the ANOVA is analyzed to see if any of the variables are significant. From the ANOVA table sig=0.000<0.05 (sig.) since sig. < 0.05, the null hypothesis is rejected and the alternative is accepted. This implies that at least one of the predictors is useful for brand loyalty of Airtel customers used as sampled

Table 6: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error			
(Constant)	2.603	0.367		7.101	0.000
Celebrity Attractiveness	0.144	0.065	0.134	2.212	0.028
Celebrity Trustworthiness	0.231	0.071	0.204	3.241	0.001
Celebrity Expertise	0.104	0.051	0.122	2.060	0.040

Note: Dependent Variable: Brand Loyalty

Source: Authors' Computation

In Table 6, the "coefficients" provides information on the impact of celebrity endorsement on brand loyalty. Since the sig. are (0.028, 0.001 and 0.040) which are lesser than 0.05. This implies that each of the variables were significant at 5% level of significant. Therefore, celebrity endorsement has a significant impact on brand loyalty.

## **5. Conclusion**

This study assessed the impact of celebrity endorsement on brand loyalty. From the result of the analysis, the findings were as follows;

Objective 1 was achieved by Hypothesis 1, which depicted through the regression analysis that there is link between celebrity attractiveness and brand loyalty. Hence, the null hypothesis was rejected. This means that celebrity expertise has significant impact on brand loyalty. Objective II was achieved by Hypothesis II, which depicted through the regression analysis that there is link between celebrity trustworthiness and brand loyalty. Hence, the null hypothesis was rejected. This means that celebrity trustworthiness has significant impact on brand loyalty. Objective III was achieved by Hypothesis III, which depicted through the regression analysis that there is link between celebrity expertise and brand loyalty. Hence, the null hypothesis was rejected. This means that celebrity expertise has significant impact on brand loyalty.

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**The Effect of Change Management Strategies on Employees Performance in Federal Inland Revenue Service**

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**Abstract**

*Modern organisations are always under the change effort to enhance internal and external organisational operations because of competitiveness in the dynamic business environment. This study investigates the effect of change management strategies on employees' performance in relation to technological changes, change management strategies and innovation implementation challenges. This study used a samples of 83 employees and data were collected using questionnaire and interview responses. Three (3) hypotheses were postulated and tested with the aid of regression analysis. The result of the three hypotheses revealed that technological up-gradation, changes in management strategies and organizational innovative culture enhances the performance of employees positively. The study concluded that investment in technological innovation, automation of the process, adequate management techniques are necessary prerequisite for the remaining is relevant in the dynamic business environment.*

**Keywords:** Change, Management, Strategy, Organization and Performance

**JEL Classification:** L25, M54

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**1. Introduction**

The ability and essence of organizations to manage and survive in changing times is becoming more complex in a turbulent environment where intense competition, technology and globalization of markets is growing astronomically. Burnes (1992) noted that change is becoming an ever present feature of organizational life.

Hennayake (2017) noted that in the current business environment, changes are increasing at rapid pace, while Adeleke *et al.*, (2016) said the basic factors of organisational challenge is the separation of structure and process.

The work of Oseni (2017) noted that change management on employees performance grow out of the need to make some adjustments within the organization in order to cope with dynamism of market trends threats of competitors or environmental turbulence. Correa and Slack (1996) noted that changes are introduced either to improve productivity or to cope with environmental change. Broni (2016) provided that changes can be influenced by positive or negative outcomes.

The positive outcome can be in form of introduction of new environment relationship(s), skills, activities, growth and development. The negative outcome according to Kotter and Schlessinger (1979) is seen in the process where the organisation is unable to achieve objectives in form of waste of organizational resources, high cost of production and poor productivity. Onugba and Onuoha (2019) asserts that change is a normal and natural response to dynamic internal and external conditions. Change is interwoven with the working of modern organisation and high complex phenomenon (Armstrong, 2008). Though Crook *et al.*, (2011) highlighted that in order to manage change appropriately, we need to understand change dynamism. Kanter *et al.*, (1992) cited in Onugba and Onuoha (2019) said change is the crystallization of new possibilities i.e new ideas policies, behaviour, patterns, new staff structure, action methodologies products and market, base on the re-conceptualized pattern in the enterprise. Similarly, Broni (2016) said change management is a process that continually renews an organization's direction, structure and capabilities to serve the changing needs of external and internal customers.

However, operating in contemporary complex and dynamic environment of business requires skillful, resourceful knowledgeable and managerial competence to effect necessary management changes. Change according to Kunle (2012) is necessary and unambiguous in a business environment. The critical issues facing businesses today is managing strategic change initiatives efficiently and effectively (Igwe *et al.*, 2014).

In addition to the inability to recognize change, it is no longer sufficient to adjust one change to compensate another. Arguably, organizations will have to handle all the challenge of change simultaneously (Kunle, 2012). These challenges of changes, at the organizational level, have elevated the importance of managing change and in particular, the managing of employees' change experience. This is because massive change has an impact on all facets of organizational members as it can create new dimensions of greater uncertainty (Waddell & Sohal, 1998). Hence, it is very important to ensure good coordination, strong leadership, and clear communication while managing various changes simultaneously. There are three major trends that shape change. Specially the three trends are; the heightened competition brought about by globalization, information technology and managerial innovation. Globalization is changing the economy and markets in which organizations operate. Though, there has been an increase in the e-business sector that is change how work is distributed and performed with the use of information and communication technology (ICT).

Moreover, managerial innovation becomes more important as a form of response to both competition and information technology trends (Kunle, 2012). A significant example of how the reshaping of managerial values, work practices and business notions onset with less domestic restrictions and trade barriers to embrace international competition is afforded by the accession of Malaysia as a member of the World Trade Organization in the 1990s. the exposure to the competitive edge of foreign organisations compelled Malaysian domestic organisations to evolve a new corporate strategy in response to changes in the cross national managerial work related values (Spicer, 2006).

Change management and its impact of organizational performance is a recurring phenomenon in most organizations including Federal Inland Revenue Service. Federal Inland Revenue Service is one of the biggest government revenue generation sector and plays an integral part of government Department. The principal idea of managing change in Federal Inland Revenue Service is to effectively introduce new techniques systems and providing remedies to multi-dimensional organizational problems. The work of Ndahiro, Shuklar and Oduor (2015) provided that the practices of change management were related with how well changes are managed in organisations so as to achieve competitive advantage through he strategic creation of a highly committed and capable workforce. Organisations according to Adeleke *et al.*, (2016) are facing more changes today as experienced preciously. Change is now similarly to standard business practices and an organisation need to change in order to remain competitive. The empirical evidence(s) of Byrant (2016), Barnabas (2010) and Ebongkang (2018) shows that fast changing technological up-gradation workforce diversity, changing consumer preference intense competition and rivalry among competing brands and forms, external environment dynamism and jolts are some of the business complexities and changes confronting organizations today. In light of the above, this study appraises the extent to which increasing technological changes affect organizational performance in FIRS, and to identify the effect of change management strategies at FIRS. Also this study examined the challenges of innovation management implementation on the performance of employees in FIRS.

## **2. Literature Review**

### *Theoretical Review*

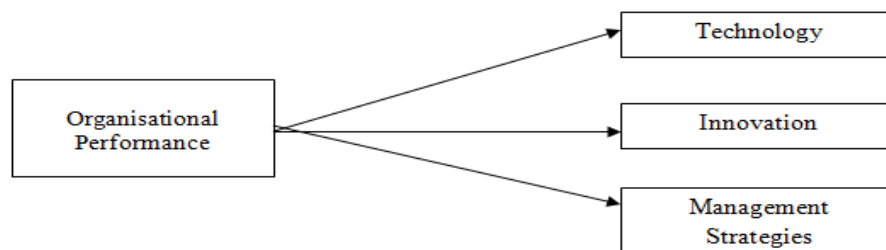
Kurt Lewin (1951) sighted in Banabas (2010) introduced the three-step change model. This model, which still holds true even today, is known as Unfreeze-Change-Refreeze refers to the three: -Stage process of change. This social scientist views behavior: as a dynamic balance of forces working in opposing directions, Restraining forces hinder change because they push employees in the opposite direction. Therefore, these forces must be analyzed and Lewin's three- "step model can help shift Fie, balance in the direction of the planned change. He described organizational change using the analogy

of the changing shape of a block of ice. According to Lewin, the first step in the process of changing behavior is to;

*Unfreeze the existing situation or status quo:* The status quo is considered to be the equilibrium state. Unfreezing is necessary to overcome the strains of individual resistance and group conformity. Unfreezing can be achieved by the use of three methods. First, increase the driving forces that direct behavior away from the existing situation or status quo. Second, decrease the restraining forces that negatively affect the movement from the existing equilibrium. Third, find a combination of the two methods listed above. Some activities that can assist in the unfreezing step include: motivate participants by preparing them for change, build trust and recognition for the need to change, and actively participate in recognizing problems and brainstorming solutions within a group.

*Lewin's second step in the process of changing behavior is movement:* in this step, it is necessary to move the target system to a new level of equilibrium. Three actions that can assist in the movement step include: persuading employees to agree that the status quo is not beneficial to them and encouraging them to view the problem from a fresh perspective, work together on a quest for new, relevant information, and connect the views of the group to well-respected, powerful leaders that also support the change.

*The third step of Lewin's three-step change model is refreezing:* This step needs to take place after the change has been implemented in order for it to be sustained or "stick" over time. It is very likely that the change will be short lived and the employees will revert to their old equilibrium (behaviors) if this step is not taken. It is the actual integration of the new values into the community values and traditions. The purpose of refreezing is to stabilize the new equilibrium resulting from the change by balancing both the driving and restraining forces. One action that can be used to implement Lewin's third step is to reinforce new patterns and institutionalize them through formal and informal mechanisms including policies and procedures. Therefore, Lewin's model illustrates the effects of forces that either promote or inhibit change. Specifically, driving forces promote change while restraining forces oppose change and this is supported in the work of George and Jones (1996), Barnabas (2010), Adeleke *et al.*, (2016) and Baba (2020).

*Research Framework Diagram*

Source: *Researcher Composition (2020)*

*Conceptual Clarification*

There are several ways of clarifying change management concept from revolution to evolution Skein (1983). Smith (1968), consider change in terms of the grand movement of the origin, transformation and differentiation of our universe, our earth and life itself, which he calls evolution. Within this total process, we are concerned with the transformation which occurred within the social organization. Such change transcends the organic and inorganic forms and occurs when men create new ways of adapting to each other and to their environment. Kunle (2012) views change in terms of the molding and modification of learnt patterns of behavior. Barnabas (2010) considers social change as alternations that occur in social organizations – that is, the structure and functions of society. Adeleke, Ogundele and Oyenuga (2016) define change as a modification or alteration of the status quo of a phenomenon. It implies some movement from one condition to another.

Adeleke et'al (2016) considers change as a modification or alteration of a current form or the state of an organism or institution which results in a different form or state of the organism or institution concerned. Change, therefore, involves innovation, which, according to Drucker (1974), is the task of endowing human and material resources with new and greater wealth-producing capacity.

*Empirical Literature*

Thomas (2014) investigated the effect of change management on organizational performance of Nigerian Telecoms Industries. The study uses 300 respondents from a population of 1000. Three hypothesis were developed to guide the study and data collected were analyzed using one way analysis of the variance (ANOVA). The result indicates that changes in technology had a significant effect on performance and that changes in customer taste had a significant effect result equally reveals that changes in management through leadership had a significant effect, on employee's performance. Based on the findings of the study, recommendations were proffered that telecoms industries in Nigeria should be proactive to change in such a competitive environment so as to experience easy implementation of required changes. The study concluded that

changes should embrace interpersonal skills in order to avoid resistance to change using appropriate change strategies to ensure effective employees performance.

Individuals as well as organizations live and operate in a dynamic environment. A change is a departure from established or customary procedures and conditions so as to achieve different or better results. Corporate or organizational change is any alteration to a corporation's structure, processes or personnel. When organizations start out, they face a set of challenges. As they progress and face competition, old processes and strategies become grossly inadequate for the need of the moment. There are several critical periods of change in an organizational life. These include: Start-ups, Rapid extension/expansion, Re-organization, Merger and Acquisition, Redundancy Programmes and Close-down. Most managers even realize sincerely that they cannot handle the change, so they collaborate with Change Agents who are adept at the implementation of various Change strategies and Intervention models. Some managers who refuse to accept the fact, often find themselves in the sea and they also put the organization in disconcerted state, i.e a state of confusion and uncertainty firms leading to the application of continuous changes and reorganization to no apparent result. Need for change arises in organizations usually as a result of environmental factors and problems. The change issue will demonstrate the future state to be understood, the present status to be abandoned, and the organized, coordinated cycle for getting from one state to the next. Barnabas (2010) focused on that, the change issue may be huge or little in extension and scale, and it may zero in on people or gatherings, on at least one divisions or ward, the whole association, or on at least one parts of the association's current circumstance. Responding to the change problem will require initiating the change process, that is, a process by which change is managed within an organization, usually planned as part of a larger strategy. The change process is examined in a subsequent session. In sum, Change Management according to Barnabas (2010), is defined as the organized procedure by which relevant models, methods, techniques, tools, skills and other forms of knowledge are adopted in a systematic way to attain desired different results from the activities in the organization. The thought of an unknown future is enough in itself to cause fear and intimidation. The future is uncertain, and people at least, have today. They do not want deviation from what they have today since they are conversant with it already. It is very common to find protests in organizations where restructuring is to take place. At the mere mention of this intention, the labour union 'draw their sword'. They are careful to ensure that the security of their job is guaranteed. They will only 'sheathe those swords' when they have that guarantee. It is very true that one's background affects his behaviour. Someone whose upbringing and background conditions him to a particular lifestyle, may be unwilling to face an entirely new life with its new set of challenges and difficulties.

Before resistance is put up at times, people do not even take time to assess the circumstances underlying the change. This inadequate understanding may lead to

misinterpretation of the reasons for the change and will lead to aggressive resistance. The initiator of a change must be able to properly communicate the change to the people concerned. Few years ago, the Central Bank of Nigeria (CBN) made several awareness campaigns when it was going to change the currency used in the country to the new notes. Of course, acceptance level was high because almost everyone heard about the change, but if the reverse was the case, resistance would have been inevitable. Where money is lacking, a lot of things are stalled. As a matter of fact, resistance level is high. The most common thought would be the change would take away some of the meager funds available. In guiding against losing the money, resistance to that change is expected. These two, are some of the most common reasons for resistance. Individuals or organizations that are buried in their own tradition or culture often say “this is the way we do our things here”. A group of people in a clique often resist changes, and would rather that issues are channeled through them, or that, they are recognize as influence before any change can occur in the organization at all. The task of managing change may not be undertaken by the organization management alone. In most cases, as pointed out earlier, change agents need to apply their ‘professional touch’ on the issues of change in the organization. A Change agent is a specialist (a consultant), usually from outside an organization who plays an importance role in adopting appropriate changes in the organization Onugba and onuoha (2019) investigated the relationship between change management and organizational effectiveness in the Nigerian Maritime industry. The study adopted emergent change as a dimension for change management while organizational effective was measured using corporate growth and for employee commitment the study adopted the cross sectional survey method. The Krejcio and Morgan formula for determining sample size was used to draw a sample of 327 from a population of 1651. The person moment correlation was used to test hypotheses posited. The findings shows that there exist a positive and significant relationship between emergent change and organizational effectiveness measured with employee commitment and corporate growth. The study concluded that organizations with absorptive capacities could transform changes into their favor if the study is built on emergent environmental dynamism. The study recommended among other that organization should invest in manpower capacity building to ensure realization of necessary organizational changes. The study of Wanza and Nkuraru (2016) investigated the effects of change management on the performance of employees in relation to technological changes, organizational leadership, structure and culture. The study accepted a case study research design. The target population was 403 employees. A sample size of 121 was drawn in single simple random sampling technique. Primary data were collected using questionnaire, analysis was done using descriptive statistics and presented using graphs and tables. The study found that structural changes, leadership technology and organizational culture influence the performance of employees in the workplace. The study recommends that leadership needed to change their mindset on the impact of change management.



The study of Ndahiro, Shukla and Oduor (2015) examined the effect of change management on the performance of Rwanda Revenue Authority. The sample size of the study was 100 respondents calculated on the basis of solving method and the selection of the respondents was based on purposive sampling. Questionnaire was the instrument used supported by secondary data. Descriptive statistics was used to obtain results of the study. The results reveal changes introduced into the organisation lead to increase in level of tax collection. The study concluded that changes made into Rwanda Revenue Authority in the past four years have been well executed. The study recommended that management of Rwanda Revenue Authority should educate its stakeholders (employees and tax payers) about new policies, procedures and programs among others.

Igwe, Raph, Nwokedi (2014) investigate the impact of change management on selected manufacturing firms in South Eastern Nigeria. Data was collected from two hundred and five (205) participants manufacturing firms who were financial members of Manufacturers Association of Nigeria (MAN). The Yamane's statistical formula was utilized for sample size determination. 207 copies of the top and middle management staff who were knowledgeable about technical information needed for implementing change management. The study used chi-square ( $\chi^2$ ) statistic and Pearson's product moment correlation coefficient. The findings reveal that change management improves the level of performance and that there is a very strong positive relationship between commitment of top management, middle management and success rate of implementation in the selected firms. The study recommends that leaders and top management of selected organization(s) should make the process of change management more conducive and all-embracing geared towards attaining organizational performance.

### **3. Research Methodology**

This study adopts a survey research design in examining the effect of change management strategies on organizational performance in Federal Inland Revenue Service and the nature of relationship that exist between the variables. The population of the current study is 105 which represent the entire staff of the branches of Federal Inland Revenue Service offices under study (that is Suleja, Gwagwalada, Kubwa and Abuja). And the sample of the study is 83 which is determined through the use of Yamani sample size formula.

#### *Sampling Framework*

Levitt (1965) argued that population and size of sample should be inversely proportionate. In this study, the sample size is derived using Yamani formula is 83 from the population of 105 FIRS staff

#### *Reliability and Validity of the Study*

Face validity and reliability test was carried out to ensure the validity and reliability of the instrument. The reliability was insured by testing the instruments for the reliability of values (Alpha values) as recommended by Cronbach (1946) sighted in Usman

(2012). Cronbach recommends analysis for alpha values for each variable under study. According to Wardsworth (2005) alpha values for each variable under study should not be less than 0.6 for the statement in the instrument to be deemed reliable. Consequently, all the statements under each variable were subjected to this test and were proven to be above 0.6. The validity of the data collection instruments was done with the help of Questionnaires. The scale are performance (0.81); Technology (0.77); management strategy (0.71) and innovation (0.68).

#### Model Specification

As earlier indicated in the hypothesis, the effect of strategic change management on the performance of the organization was tested using regression with aid of statistical package of social sciences (SPSS). A regression or a bivariate regression analysis is a statistical technique that uses information about the relationship between an independent or predictor variable and a dependent or criterion variable, and combined it with the algebraic for a straight line to make prediction (Hair, Bush & Ortinau, 2000).

Thus, Linear Regression Models are given below:

$$EMP = \alpha_i + \beta X_i + u \dots\dots\dots 1$$

Where EMP is the workers performance, TEC represents technology, MGS stands for management strategies, INN indicates innovation,  $\alpha$  is the Intercept or Constant,  $\beta$  represents slope of the regression line,  $i$  denotes cross sectional dimension, and  $\mu_i$  stands for individual specific disturbance effect (error term), do not vary over time

## 4. Result

#### Analysis of Data

Employees' performance is the dependent variable, while other three independent variables are technology, change management strategies and innovation.

Table 1: Coefficient<sup>s</sup>

Model	Unstandardized	Standardized		Collinearity Statistics			
	Coefficients	Std. Error	Beta	t	Sig.	Tolerance	VIF
(Constant)	0.463	0.299		1.573	0.001		
TEC	0.418	0.119	0.456	3.622	0.000	0.680	1.449
CMS	0.118	0.115	0.126	1.067	0.000	0.708	1.415
INM	0.199	0.125	0.170	1.643	0.000	0.977	1.032
R			0.568				
R Square			0.322				
Adjusted R Square			0.290				
Std. Error of the Estimate			0.396				

Note: a. Dependent Variable: EMP

Source: Authors' Computation, 2020

Table 1 show the mode, unstandardized coefficients, standardized coefficients, significant level and collinearity statistics. The tolerance level of the three independent variables is given as 0.680, 0.708 and 0.977. With the high level of tolerance level above 0.500, the variables are accepted as indicators to induce changes in organizations.

Also, Table 1 reveals that the model is fitted, having coefficient of correlation (R) of 0.568. The figure indicates that there is high positive relationship between the role of Technology, Management Strategies, Innovation and Performance of Employees in FIRS. R-square is given as 0.322. This value indicates that there exists 31% of putting to use the instrument of change, while the remaining 69% explains the variance of the role of performance in an organization. The adjusted R-square is given as 0.290 and it should be noted that the higher the adjusted R-square, the lower the standard deviation.

#### *Test of Hypothesis*

The first hypothesis is that change in technology does not have any significant effect on performance in Federal Inland Revenue Service. Given the decision rule, since  $P_{sig} < P_{value}$  (0.05), hence, the null hypothesis ( $H_{01}$ ) is rejected while alternative ( $H_1$ ) is accepted. Therefore the interpretation is that the significant level for changes in technology is given as 0.00, which is far below the Pvalue. Therefore, the study accepts the null hypothesis ( $H_{01}$ ). Thus, the variable change in technology is significant to induce performance in Federal Inland Revenue Service.

For the second hypothesis, a change management strategy does not affect performance in Federal Inland Revenue. Given the decision rule, since  $P_{sig} < P_{value}$  (0.05) hence, the null hypothesis ( $H_{02}$ ) is accepted while alternative ( $H_2$ ) is rejected. Thus, the interpretation states that, the significant level for change management strategies is given as 0.00, which is far below the Pvalue. Therefore, the study rejects the null hypothesis ( $H_{02}$ ). Thus, the variable changes management strategy is significant to induce the performance of employee in Federal Inland Service.

Lastly, iInnovation Management does not affect performance in FIR. Given the decision rule, since  $P_{sig} < P_{value}$  (0.05) hence, the null hypothesis ( $H_{02}$ ) is rejected while alternative ( $H_2$ ) is accepted. The result indicates that, the significant level for innovation management implement is given as 0.00, which is far below the Pvalue. Therefore, the study accepts the null hypothesis ( $H_{03}$ ). Thus, the variable (Innovation Management Strategy) is significant to improving performance at the work place.

#### **5. Conclusion and Recommendation**

Job repetition does not achieve different results. Change is very difficult to adopt in every human endeavor, however when it is adopted there is expectation of a good outcome. Strategic change management in organization always comes with the purpose to improve performance in the long run. Strategic change managed from top-down (that is management driving change down the organization), geared towards developing

human capital will not only make the subsequent change meaningful but achieve the employee performance.

As found in the result, strategic change influences employee's performance through technology, change management strategies and innovation. Therefore, the independent variables should be seen as driver of employee performance. This is empirically tested in the study. Within the study, it was found that other variables like gender, age, educational level and years of service can influence employees' performance but they were controlled. The study recommends that, there is the need to invest in technological up-grade and improvement to allow the sector to be competitive. Technological transfer and diffusion should be an important component of the sector. Manager should clearly define the vision of change, set the right scope and incorporate it into the objective. They should have strong team and guiding principles for change projects and adopt flexible change project management methodology, flexible in implementing strategy, evaluate impact of change on everyone, and define changes at the micro level; involve employees and stakeholders.

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## Science, Technology and Innovation: The Importance of Multi-Media in Academic Libraries

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### Abstract

*In the present academic and special library setting the educational videos, instructional visual aids and audio learning resources form a significant collection. Time is fast catching up the world over that the traditional forms of collection development techniques and collection maintenance strategies need replacements with the upcoming trends in the profession. Connoting the essence of libraries as a collection of sources of information and similar resources, selected by experts and made accessible to a defined community for reference or borrowing, often in a quiet environment conducive for study. The study discuss briefly main elements of multi-media, types, methods of presentation, types of software, access methods and its advantages in academic libraries.*

**Keywords:** Academic Library, Multimedia, Software, Learning, Video Resources

**JEL Classification:** O14

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### 1. Introduction

Libraries have always made information available to users. From the earliest days, they housed and facilitated access to information through the selection, aggregation, organization, service, and ongoing care of the materials as a shared good and in supporting the academic, university, or college community and curriculum. Information contained in these materials could be in text, video, pictures, images or merged together in the same device. This leads us to the concept of multi-media as that device that uses a combination of different content forms such as text, audio, images, animation, video and interactive content.

According to Chambers 21st Century Dictionary, multimedia involves the use of a combination of different media especially in entertainment and education such as TV, radio, slides, In-fi, and visual arts. Typically, this is the field concerned with the computer controlled integration of text, graphics, drawings, still and moving images (video), animation, audio and other media where every type of information can be

represented, stored, transmitted and processed digitally. It could also be referred to as; a computer system that is able to present and manipulate data in a variety of forms e.g. text, graphics, and sound often simultaneously. Information are imbibed in various formats that is needed to be processed, organized and made available for easy accessibility for the users. Information could be either in text, pictures, images, video etc. or merged as one in the same device.

The growing importance of documents represented in nontraditional media is challenging the traditional notion of a library collection. These new technologies offer students, teachers and researchers access to materials as never before. Multimedia can deliver large amounts of information in ways that make it manageable, approachable, and useful. And by making it possible to access illustrations and photographs, sound and video, as well as large amounts of text, interactive multimedia programmes. Present learning information to teachers, students, and scholars in newly engaging and meaningful ways. The integration of multimedia programmes into libraries and classrooms promise not only to change the kinds of information that is available for learning, but also way learning takes place.

Multimedia is a content that uses a combination of different content forms such as text, audio, images, animation, video and interactive content. This differs from the media that use only rudimentary computer displays such as text only or traditional forms of printed or hand provided materials. Kate (2011) opines that, electronic information and multimedia in general, is about to become a vital part of our cultural heritage. Libraries from time immemorial have ensured a democratic independent and free access to the knowledge and intellectual value represented by conventional books. To some extent libraries should be at all times able to make information available to the users of the library in simple and clear way.

According to Bhatt (2018), many big libraries including the Library of Congress (LC), British Library, OCLC, etc, are building their collections in multimedia form. Apart from multimedia collection development in 1990, LC began the American Memory Project, aided by Annenberg Fund; the David and Lucile Packard Foundation and others for preparing multimedia CDs. This covered several kinds of information including country's historical books, pamphlets, photographs, folk songs, movies, genealogical works, etc. There are a few surveys in the literature that are focused on the usage of multimedia technology in public libraries, academic libraries and special libraries. These studies primarily cover the use of multimedia CD-ROMs in libraries and also the use of World Wide Web and internet. Singh (2016) opined that technological development have given rise to the new ideas relating to collection, processing and dissemination of information. These developments and ideas include use of multi-media technology, the study went further to say that, multimedia technology is a combination of several forms. The form of information could be text, audio, visual, graphics, image audio or video etc. With advancement in information



technology, multi- media systems plays a more important role and had an impact on our lives. From home entertainment, through training, education, medicine and health services and financial services to business communication multi- media plays an important role.

In common usage, the term multi- media refers to an electronically delivered combination of media including video, still images, audio, text in such a way that can be accessed interactively. Much of the content on web today falls within this definition as understood by millions. Multi- media is a media that uses multiple forms of information content and information processing (e.g. text, audio, graphics, animation and video, interactively to inform or entertain the user (audience.).

## **2. Main elements of multi-media**

Basically multi-media are constituted by seven elements. These elements include: text, data, graphics, photographic images, animation, audio and Video. Referring to text, these are the information about an object event such as notes, captions, subtitles, contents, dictionaries, and help facilities. The first element of multi-media consists of tables, charts, graphs, spreadsheets, statistics and raw data from the major data in multi-media. In the same vein, both traditional and computer generated such as drawings, prints, maps etc are the graphics in multi- media environment, while photographic images include negatives, slides, and prints among others. Computer generated videos are examples of animations. Music digitized and speeches from cassettes, tapes, CDs etc are audio element of multi-media, and finally, video include anything converted from analogue could it be film or entirely created within a computer.

A multi- media system records, processes, stores and delivers all types of information in binary code the same way as a computer does. This is entirely different from the traditional analogue technology of radio. TV, A-V tapes gramophone records or the combination of digital audio and analogue video in interactive video class. For a better performance especially in playing digital audio and video, a multi-media system will have a powerful PC with high-end graphics processors, a soundcard, CD drive and multi-media extension and functional drivers.

### *Types of Multimedia and their Patens of Presentation*

There are three mayor types of multimedia in use. These are online, offline and hybrid multimedia. Online Multimedia is a product that needs to communicate with distant resources and sometimes distant users. Examples include web sites, mobile services among others. Through this forum, communication is made fast and is easily passed to the targeted audience, thereby making service delivery more efficient. In the case of offline multimedia which is a self-contained product and which does not communicate with anything outside its immediate environment. This simple means that, communication is contained within the environment. Examples of offline multimedia include CD, DVD, and Multimedia Kiosk etc.; while hybrid multimedia contains elements of both on-and offline products e.g Computer games.

Patterns of multimedia presentation follow two major dimensions. They are linear and user active. The two dimensions have their peculiarities. With linear multimedia, users have little access or control over the presentation. What happens is for the users to sit and watch as the presentation goes. Users can only watch and comprehend the information therein. Again in linear multimedia, presentation could go on playing from the start to end or even loops over continuously to give or present the information to the user(s). A movie is a typical common example of a linear multimedia presentation.

In the case of user active multimedia presentation, users could go on to dictate the flow of information presentation. That is to say, users have the ability to move around or follow different paths through the information presentation. It has advantage of presenting a complex domain of information. Its biggest disadvantage is users might get lost in the massive information highway.

### **3. Multimedia Software and Access Methods**

Software is what makes the computer worthwhile. Eventually, there are two types of software and they are system software and application software. While system software helps the computer perform essential operating tasks and enables the application software to run, application software on the other hand enables one to perform specific tasks—solve problems, perform work, or entertain one self. Hence multimedia software is the software with which one can easily combine texts, videos, audio and image files. They have the ability of enhancing texts of any type the user want to use. With these software one can create, arrange, mix and record different types of music and videos. It could also be connected to computer with some musical instruments to enhance its performance. The most patronized multimedia software includes: VLC player, moviemaker, Windows Media Player, Adobe Photoshop, Media Monkey and Inkscape Windows.

VLC media player is a free and open –source portable cross – platform media player software and streaming media player developed by the Video LAN project and most available for desktop operating systems and mobile platforms, e.g Android, IOS, iPadOS etc. Moviemaker however, is discontinued video editing software created by Microsoft it can be used in editing and publishing audio tracks. While Windows Media player (WMP) is a media player and media library application used for playing audio, video and viewing images on personal computers running the Microsoft Windows operating system among others. Adobe Photoshop on the other hand is sophisticated tools that designers, graphic artists, photographers and web developers use. It is equally used for image compositions, website mockups and adding effects. But Media Monkey is a digital player and media library application used for organizing and playing audio on Microsoft Windows operating systems. The software was developed by Ventis Media Inc. and Inkscape is graphic software which runs on Windows, MacOS X and GNU/Linux. It is used by designers and hobbyists for creating wide variety of graphics such as illustrations, icons, logos, diagrams, maps and web graphics.

#### **4. Multimedia in Libraries**

Multimedia helps users in providing information from different media on one platform and also saves on space, money, maintenance, operational inconveniences among others. Multimedia has a lot of advantages in the library, for it enhances its operations in the process of service delivery. Among the major advantages of multimedia in libraries are: It is user friendly. That is to say, it is interesting and easy to use over the existing form such as print, microforms, online, etc.; it can create forum for meeting various types of information preferences of the users, such as scholarly, scientific, vocational, artistic, and recreational among others; it can help in satisfying different information needs such as reference, enrichment, entertainment, and leisure among others.

Information can also be accessed by remote users on a network; it can also help in overcoming the barriers of boundaries, proximity and physical capacity of a library to accommodate users; it control and interactivity helps the users and provides the benefits of books to human beings; it increases learning effectiveness. Offers significant potentials in improving personal, communications, education and training efforts; it reduces training costs, and educationally. It provide students with opportunities to represent and express their prior knowledge; allow students to function as designers, using tools for analyzing the world, accessing and interpreting information, organizing their personal knowledge and representing what they know to others; it engages students and provide valuable learning opportunities and Create personally meaningful learning opportunities. From afore mentioned benefits one can therefore conclude that multimedia is of much importance in the library as one of library information data base that enhances learning.

#### **5. Conclusion**

In this paper we arrived at the conclusion that multimedia is strong information medium. This is to say being digitized information medium; it plays a major role in explaining and interpreting information in virtually all forms with ease. Data could be transformed in text, video, pictures or even in animation as the case may be. This makes it possible for the readers to access, understand, and comprehend the message contained therein. It enhances interactivity in training session thereby making the users livelier in the course of lecturing and training. Predominantly multimedia collection of a library comprises video resources (educative as well as entertainments), audio recordings, computer-based training materials (CBTs), Web-Based Training materials (WBTs), illustrations, photographs etc. Depending on the nature of parent institutions goals, academic focus, research thrust its resource allocations and financial capabilities, their collection strength may considerably vary.

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